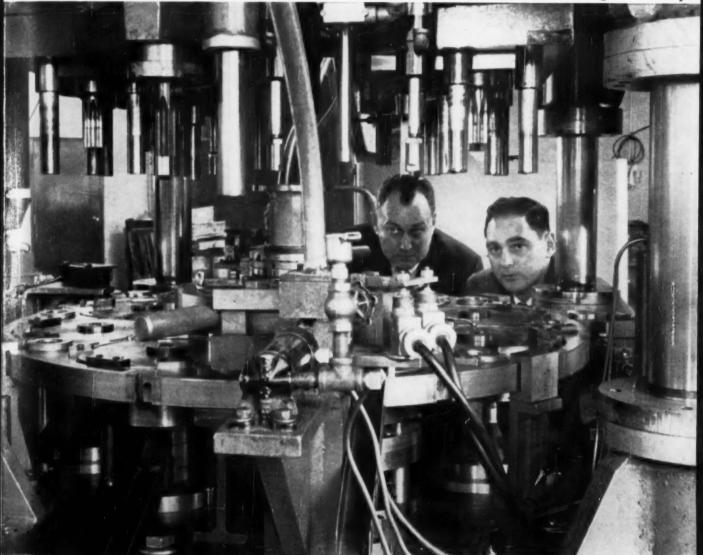
The IRON AGE

February 12, 1959

A Chilton Publication

The National Metalworking Weekly



Cold Extrusion
Opens Door to New
Business
P. 95

What Price High Labor Turnover? - P. 57

Are Tax Reforms
Starting to Pay Off? - P. 62

Digest of the Week - P. 2-3

ELECTRIC FURNACE STEELS

BEARING QUALITY - AIRCRAFT - PISTON PIN QUALITY - ELECTRIC FURNACE ALLOY - ELECTRIC FURNACE CARBON - ALLOY BASE ALLOY - QUALITY CARBON

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NEW PRODUCTS & FACILITIES CATALOG

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The IRON AGE

February 12, 1959-Vol. 183, No. 7

Digest of the Week in

*Starred items are digested at right.

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NEWS ARTICLES

LABOR TURNOVER

Cost-Cutting Area—The high cost of labor turnover is one of industry's blind spots. An expert tells



how to approach this weak link in personnel policy. P. 57

MAINTENANCE COSTS

Warning Sounded — A decade ago, few factory managers were worried about maintenance costs. Now it is realized that industry may be wasting \$4 billion annually.

P. 61

TAX LOAD

Lighter for Industry?—For the first time, depreciation allowances topped corporate taxes in 1958. And tax code changes may finally be paying off in tax relief to industry.

P. 62

FREE CHINA'S STEEL

Growing Fast — Free China's steel output will be at least doubled by 1961. A new mill under construction in Formosa is likely to spur industrial expansion. P. 64

Metalworking



cold extrusion: It's a tricky method, but not as tough as you might think. M & S Mfg. finds it can pay off handsomely. D. A. Lillywhite, vice president, and G. W. Fiddyment, manufacturing engineer, study twin tooling setups. P. 95

KAISER STEEL'S CLIMB

Into Top Ten Steelmakers—With dedication of new oxygen furnaces Kaiser has closed out its current \$214 million expansion. P. 79

TOOL BUILDERS' PROBLEMS

Do They Weaken Defense?—The recession dealt the machine tool builders a mighty blow. Along with other problems, it sank U. S. output below that of the Reds. P. 81

FEATURE ARTICLES

GUN DRILL AND REAM

For Precision Holes—Modern, fast-cutting tools save time and money in precision hole-making. Savings stem from the production of true holes and excellent microfinishes. No longer restricted to deep holes, both techniques work in a variety of materials and part shapes.

P. 98

PRECISION BEARING

Goes to Record Size—Designed to support a missile-detecting radar, a 165-in. diam precision roller bearing posed special design problems. Bearing takes radial, thrust, and overturn loads.

P. 100

FURNACE HEATING

Electronics Solves Problems—A new electronic device could be the key in solving furnace heating problems—in forging, heat treating, melting, and a host of other applications. Setup consists of electrical

control panel and an automatic temperature recording unit. P. 102

LOW-COBALT STAINLESS

For Nuclear Applications—With expansion of nuclear applications, more attention will have to be paid to tracing cobalt contents in commercial steels especially stainless. Here is a rundown of problems and the solutions offered.

P. 106

ALUMINUM HARD COATING

How to Judge—Hard anodized coatings for aluminum have many industrial uses—so long as coating quality is maintained. It pays to check various methods for determining coating quality.

P. 108

MARKETS & PRICES

CONSTRUCTION EQUIPMENT

Good Sales Year—News of upturn in construction contracts cheers equipment builders. With help of a strong first half, they expect a near-record year. Industry sales could reach \$2 billion.

P. 59

REINFORCED PLASTICS

Solid Sales Gain — Reinforced plastics sales were up 10 pct in 1958 despite the recession. Still further gains are looked for this year. Auto and boat applications are big growth markets. P. 60

AUTOMOTIVE GLASS

Reached the Limit?—Glass area in cars has increased as much as 66 pct in the past 30 years. Now designers are considering its use as a structural material.

P. 73

MARKET STRENGTH

It's Real—Steel men say strike hedging is only part of the story behind market upsurge. Evidence is growing that steel users are buying for actual needs as well as strike hedge.

P. 141

ALLOY METALS

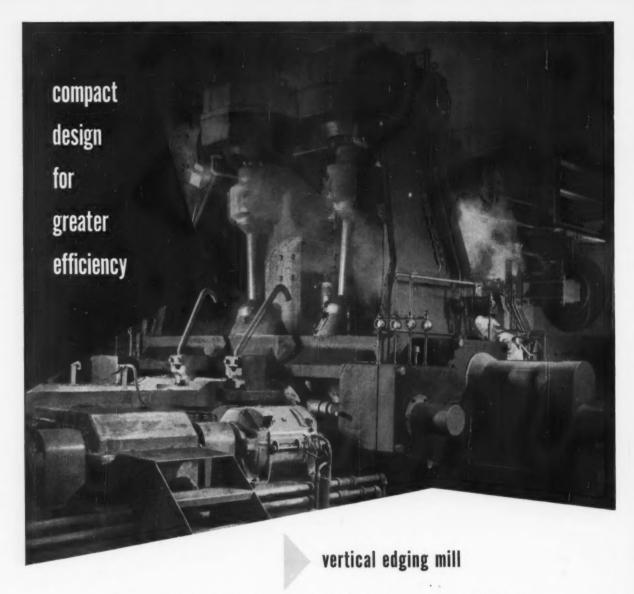
Shortages Are Over—Allegheny Ludlum purchaser believes users of nickel, chromium, and tungsten can forget about possible shortages. Speculative, long-range buying is not worthwhile, he says. P. 142

NEXT WEEK

OUTLOOK FOR EXPORT

Changing Markets—Many metalworking companies are finding themselves priced out of foreign markets. Does it mean permanent loss of world markets? Next week's Special Report to Management analyzes the world trade outlook.





The overhead design of this edging mill is the key feature of this typical PITTSBURGH installation. Increased operational efficiency is a natural result of special design.

One giant casting outlined in yellow in the photograph was produced by Pittsburgh Steel Foundry Division. Extensive machining facilities are combined with one of the largest steel foundries in the world to produce the finest possible equipment for our customers in the shortest possible time.

We invite your inquiries for primary and auxiliary rolling mill equipment.

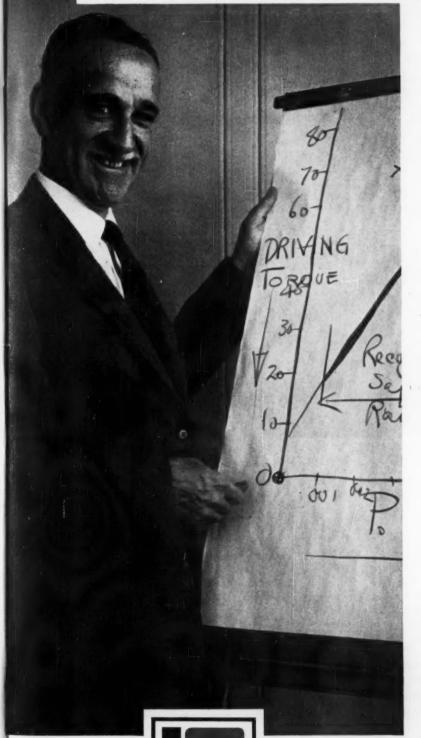
"Electric and open hearth steel castings from 1 lb. to 100 tons"



SBURGH

ENGINEERING & MACHINE

Division of Pittsburgh Steel Foundry Corporation P.O. BOX 986, PITTSBURGH 30, PENNSYLVANIA PLANT AT GLASSPORT, PENNSYLVANIA WILLIAM G. WALTERMIRE, Chief Products Engineer, Lamson & Sessions, says...



Your interest... and ours... is "assembled product cost"

Many fastener users think only in terms of unit price. Actually, labor costs of assembly are usually 3 to 4 times the price of the fastener itself.

Your Job, and ours, is to find practical ways to cut your "cost of assembled product". To do this, we frequently hold meetings with purchasing personnel, design engineers, standards engineers, and quality control people at our customers' plants.

By means of charts and slides, we show how to simplify types and sizes of fasteners used, which reduces purchasing and inventory costs. We guide them in selection of thread classes to meet different material, tapping and assembly problems. We often suggest ways to improve strength and cut costs—by substituting a smaller high carbon fastener for a larger size, low carbon type. Or we may suggest redesign of a bolted assembly to use standard instead of special fasteners.

Take advantage of this no-charge L & S service. Call or write us for an analysis of your fastener problems.

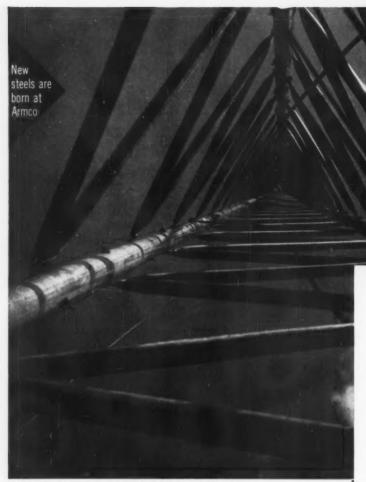
L&S Fastener Engineering helps you "tighten up" on...

- . PURCHASING COSTS
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- . ASSEMBLY COSTS

LAMSON & SESSIONS

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Plants in Cleveland and Kent, Ohio . Chicago and Birmingham



This giant microwave tower is fabricated from Armco ZINCGRIP Steel Tubing. It is a product of Alprodco, Inc., Memphis, Tenn.

Every structural member in this 260-foot microwave tower is made from Armco ZINCGRIP® Steel Tubing. Test loads testify to its strength in high winds. Its durable zinc coating assures resistance to rust.

Armco ZINCGRIP Tubing provides this same sturdy strength and corrosion resistance in hundreds of other products—from farm gates, TV masts and playground equipment to carport supports, sign posts and conveyor rolls.

Wherever you need structurals that must resist rust, must remain strong, consider Armco ZINCGRIP Steel Tubing. It's a low-cost solution to problems of tubular design. What's more, it can be readily fabricated without flaking or peeling of its full-weight, hot-dip coating of zinc.

In addition to this zinc-protected grade, Armco produces two durable grades of aluminum-coated tubing. For more information about these cost-saving Armco Coated Tubing grades—why and where they're used—just fill in and mail the coupon.

Husky tower of Armco ZINCGRIP Steel Tubing shrugs off wind loads, resists rust

ARMC	O ST	EEL COI	RPORATION	
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Please send me a copy of your folder, "Why Designers Specify Armco Coated Tubing."

We make

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TITLE

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ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Major Labor Reforms: They Are Bound to Come

Labor leaders have had things pretty much their own way for years. Unions have grown in strength—and power. Some labor czars have grown even stronger, so strong in fact that they don't know when to backtrack.

Most managements have no real quarrel with the majority of labor people. They feel, of course, that unions always have and always will drive for the biggest concessions they can get, no matter what the cost to management.

Few managements think they can singlehandedly bear down enough upon most unions to get decent and reasonable settlements. The result has been a series of attempts to keep labor costs in line. When this failed, prices were advanced to take care of part of the increases.

Union heads seem quite sure that when the chips are down, the workers—organized and unorganized—will support them. Maybe that's true up to a certain point. But when the public gets hurt it looks for someone to take it out on. For years business has been a favorite whipping boy. Maybe that will change. Maybe now is the time for labor statesmen-to-be to take a good hard look at some of their brothers in the lodge.

There can't be many more strikes like the

newspaper mail and delivery walkout which tied up major New York newspapers last Christmas. And it threw thousands upon thousands of other workers out because the papers had to suspend publication. It was the public which got riled up and mad enough to give someone the heave-ho.

Take the case where Jimmie Hoffa suggested all policemen get into his union. That was one for the books. For outright arrogance it has no equal in modern history. The uproar that followed that didn't do unions any good. But it didn't faze Hoffa, either.

When the public realizes that major unions such as the coal miners, the steelworkers, the truckers, the auto workers, the longshoremen, and a few others can shut down the nation whenever they want to, then look out!

Some day the power of the unions will be taken so much for granted that too many leaders will go too far. That is the day when not only major but maybe punitive reforms will take place. They will be dictated by the people, not by management or government.

Perhaps Mr. Eisenhower is a better friend of labor than he is given credit for. We think he is more than a "voice in the wilderness."

Tom Campbell

Editor-in-Chief

Amchem Alodine...











FOR ALUMINUM



If you fabricate aluminum products-painted or unpainted-Amchem Alodine can provide you with an effective and protective chemical conversion coating process of remarkable characteristics.

The Amchem Alodine process forms an amorphous coating which becomes an integral part of the metal, enhances the natural corrosion resistance of the aluminum and provides an excellent bond for paint. Alodine's simplicity, speed and economy as a prepaint treatment has gained widespread commercial acceptance in a wide variety of product applications.

Beyond product, Amchem provides the metalworking industry a complete service-processes, technical and engineering assistance, installation and instruction service-for corrosion protection, paint bonding, or other metalworking problems.

Write for complete information contained in Bulletin 1424A describing the uses of Amchem Alodine, as well as other literature pertinent to Amchem chemical conversion processes for the metalworking industry.





AMCHEM A

Amchem Alodine is another chemical development of Amchem Products, Inc., Ambler, Pa. . Formerly American Chemical Paint Company Detroit, Mich. . St. Joseph, Mo. . Niles, Calif. . Windsor, Ont./Amchem and Alodine are registered trademarks of Amchem Products, Inc.

Ductile Molybdenum Weld

Molybdenum, tough to fabricate, even tougher to weld, bows to a new technique. It's a spotwelding method that produces a sound, internal bead in molybdenum sheet. Most significant: some bend ductility is retained in the area of the weld. This step forward makes possible the fabrication of high-strength sandwich structures and other sheet metal components, using molybdenum exclusively.

Powder for Refining Iron

Developed in France, the oxygen/lime-powder process is showing signs of progress. The method adapts to pig irons of widely different compositions. The lime powder is blown in suspension with pure oxygen. One French mill has produced about 10,000 tons of steel, sold on a commercial basis as high quality openhearth steel.

Spiral Cuts Tap Breakage

A greater angle of spiral in a new tap removes chips at a fast rate to reduce breakage in tapping ductile materials. Chips move in fast easy stages with continuous thrust from the sides of the flutes. On reaching surface of workpiece they are propelled out of the hole away from the tap.

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In-Line Honeycomb Braze

A continuous brazing process for stainlesssteel honeycomb panels preheats, brazes and heat treats as the material moves through a gas-fired infra-red enclosure. The prototype furnace takes panels of various sizes, which can be stretchformed to contour. The system eliminates large furnace installations, carbon blocks, and long lay-up times needed for batch methods.

Cutting Nuclear Materials

Radically different tool bits for machining nuclear materials are a development of a cutting-tool producer. Working with a major carbide supplier, the company has formulated new carbide compositions. These tools with extreme rakes and

angles are said to be quite successful in machining nuclear compounds about as hard as stainless and more abrasive than cast iron. Cutting speeds are in the range used for ceramic tools.

World Labor Rates Up Too

American manufacturers who believe they are being priced out of world markets have one consolation: Some recent studies show that labor cost per unit of production is going up as fast in European countries as in the U. S. In some cases, straight labor costs are going up even faster abroad, but so is productivity.

Stress Private Enterprise

Republican leaders aren't going to give ground in their fight for a balanced budget. They believe the GOP must stand firm for private enterprise against government spending blocs. Although conservatism didn't pull the congressional elections out for Republicans, top leaders believe it's their only hope for the 1960 Presidential race. But they'll continue to support foreign spending.

Rockets for Space Station

Army space experts now believe they'll be able to hurl a 25,000-lb space station into an earth orbit in 1960. Total thrust of 1,500,000 lb will be developed by clustering existing rockets. An Atlas rocket would serve as the second stage, and a high-energy fuel the third.

To Check Engine Castings

An ultrasonic gage simplifies measuring thousandths of an inch variation in cylinder wall thickness. Developed to improve quality control of engine castings, the non-destructive tester adapts to measure thickness of straight or curved surfaces of cast iron, steel, aluminum, magnesium, brass, lead, glass and most solid plastics—with only one side of the material accessible. The unit uses the principle of ultrasonic resonance.

LIGHT GAUGES

at High Speeds

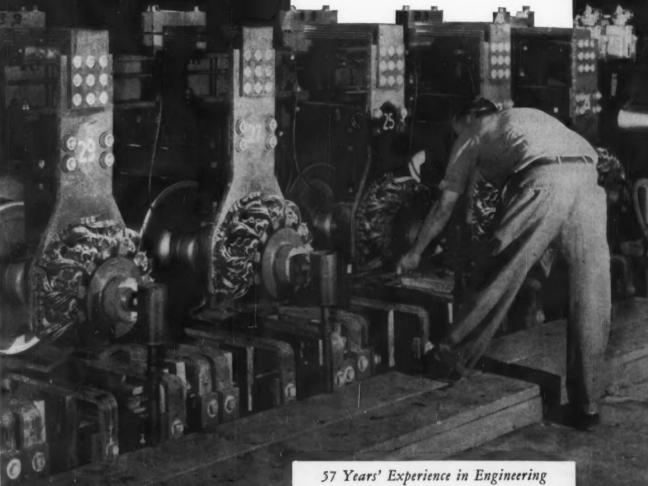
Need Rugged

Equipment

Higher and higher speeds and lighter and lighter gauges in tin plate put a greater and greater demand on equipment. Highspeed Continuous Processing Lines must be more rugged than ever before to stand up to 21-turn operation. Our experience with processing lines dates back to the earliest production of strip in coils. In those years and today, ruggedness of equipment has been a trademark of Aetna-Standard.

AETNA-STANDARD

The Aetna-Standard Engineering Company
FRICK BUILDING - PITTSBURGH, PA.
ELLWOOD CITY, PA., WARREN AND AKRON, O.



57 Years' Experience in Engineering
Equipment for Processing <u>ALL</u> Gauges
of Sheet and Strip

Overseas Markets

Sir-The article by W. F. Rockwell in your Jan. 8 issue on "Manufacture Overseas to Reach Europe's Expanding Markets" was appreciated.

I would like very much to have thirty copies to circulate to our Industry Divisions as an example of how this trade is developing and the great potential for overseas investment.-G. T. Elliman, advisor on Foreign Activities, U. S. Dept. of Commerce, Business and Defense Services Administration, Washington.

Japanese Plate

Sir-I read with interest your article "Why the U. S. Navy Buys Japanese Plate" in the Jan. 22 issue.

I took exception to one paragraph—the last one—about the fact the Japanese supplier must pass the same rigid inspection given American steel producers.

Do you think for one minute they have wage and hour laws? Do you think they have fringe benefits, paid holidays, birthdays, and time off for a death in the family? Any of the things that make the American working man the highest paid in all the world?

Before we are all sold down the river we must mend our fences quickly. Print the facts as I know you must but point out in your editorials "the facts of life"-before they become the "facts of death" -to our way of life.-E. F. Galvin, Galvin Tool Sales Co., New York.

■ We feel exposing such purchases is, in a sense, an editorial job because it tells a lot of people what is going on.

According to our Washington Bureau, Japanese steel production workers in September, 1958 earned about \$65 for the month, including base pay, marriage allowances, and certain other benefits, but not welfare funds or housing. The industry pays a year-end bonus of about 10 pct of a worker's total earnings for the year. The Japanese Commercial Counselor in Washington reports base pay of a mature steel industry production worker is about \$60 a month plus \$20 to \$30 a month for housing and other benefits. At best this is about \$81.55 a month.

Average hourly wage cost for steelworkers in the U.S. in the recession month of September, 1958 is given by the American Iron and Steel Institute as \$3.274. The September work week averaged 36.5 hours for hourly rated employees.

During the third quarter of 1958 steel companies' total employment costs per hour (for wage earners) rose to an estimated \$3.60.—Ed.

Sir-Reasoning of our Navy purchasing department in buying Japanese plate is ridiculous.

Conservative thinking would show that even the high U. S. bid would save this government twice as much as the low Japanese figure.

At least 25 pct of the price of a U. S. mill would be reflected in taxes, income taxes (individual and corporate), real estate taxes, and dozens of others.

Our government along with the misguided souls who purchase foreign-made automobiles are not helping our country. When are Americans going to learn that every dollar spent on foreign goods is costing our labor and business the biggest part of that dollar?- C. A. Lapp, C. A. Lapp & Co., Cleveland, O.



Brass Company, This fantastic ratio is possible only at Somers, where the latest



as the "World's largest builders of the world's largest cranes". But size doesn't automatically answer a customer's needs.

ALLIANCE meets customer's capacity requirements with skillful engineering, and absolute minimum of downtime and maintenance.

Look to ALLIANCE for greater overall return for your investment.

Regardless of size or capacity, for economy of operation, ALLIANCE LEADS THE WAY.



machine



company

Idea Chillers

If you want to kill new ideas we recommend these guaranteed chillers taken from fifty-six put together by the New York Chapter of the American Society of Training Directors. The list appeared in the Well, published by F. E. Myers & Bro. Co., Ashland, Ohio:

Don't be ridiculous.
We tried that before.
It costs too much.
It's too radical a change.
We don't have the time.
We're too small for it.
The union will scream.
We've never done it before.
Let's get back to reality.
That's not our problem.
Why change it, it's still working

okay.

We're not ready for that.

It isn't in the budget.

Top management would never

go for it.

We did all right without it.

Let's shelve it for the time being.

Let's form a committee.

Has anyone else ever tried it?

The Velvet Touch

On the other hand, employee suggestions are really welcomed at the U. S. Bureau of Reclamation, Sacramento, Calif. W. G. Waggoner, personnel officer there saw to that. He devised a "Genie" suggestion box.

As you approach an electric eye sets it in motion. A music box plays and printed tapes give out a suggestion pep talk. Then, while you funnel in your ideas, a mechanism at the bottom gives you a free shoe shine.

How Big A Share?

Sixty pct of Americans say corporations make an average profit of 25 pct. They regard this as too high—believe about 10 pct would be reasonable.

Keen Johnson, vice president, Reynolds Metals Co., pointed out this misconception during a recent speech to advertising and sales executives.

He then presented the true facts: Combined net profit of the 1017 companies listed on the New York Stock Exchange in 1957 was \$16.5 billion. Sales volume was \$233.5 billion. This meant an average profit on sales of 7 pct.

Thirty Day Salute

April may become the month for honoring welded products as well as the month of showers.

Rep. Frank C. Osmers, (R-N. J.), has introduced a resolution in Congress which would "authorize and request" the President each year to issue a proclamation making April "national welded products month."

This would be "in recognition of the significant contributions which welding technology and welding inventiveness have made in modern industrial practice and to the American way of life."



"I suppose you might say I've been a success in every way except financially."



ABOUT FLEXIBLE TUBING PROBLEMS

PENFLEX Has The Answer

with a complete line of all types and sizes of flexible metallic tubing. plus "Flexineering." That well-known technical help of Penflex engineers on your specific design, application and installation. plus the "Know-how" to supply just the right flexible tubing you need.

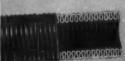
Whether you need steel, bronze or stainless-steel to convey air, oil, water, gas, steam, volatiles or light solids, Penflex has the answer. Its complete line of corrugated and interlocked tubing is rugged, safe at high pressures and temperatures. Write for complete data to Pennsylvania Flexible Metallic Tubing Co., Inc., 7210 Powers Lane, Philadelphia 42, Pa.



NEW DATA BOOK FREE Write for your copy.



Ponflex Interlocker Hose



Penflexwold All-Metal Tubing



NOW YOU WILL KNOW THEY ARE FROM



This New Emblem is your assurance of carbon and graphite

is your assurance of carbon and graphite products—production engineered to the highest standards of quality.

The emblem is being introduced in all of our packaging — in electrode end protectors, nipple cartons, palletized anodes, palletized carbon brick, and drums of carbonaceous materials.

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COMING EXHIBITS

Western Metal Show—March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show — March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

1959 Nuclear Congress—Apr. 5-9, Cleveland Auditorium, Cleveland. (Engineers Joint Council, 29 W. 39th St., New York 18.)

Welding Show—Apr. 6-10, International Amphitheatre, Chicago. (American Welding Society, 33 W. 30th St., New York.)

Engineered Castings Show — Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Exposition—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, N. Y.)

Powder Metallurgy Show — Apr. 20-22, Sheraton - Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

Design Engineering Show — May 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Material Handling Show — June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

MEETINGS

FEBRUARY

The Metallurgical Society of AIME—Annual meeting, Feb. 15-19, St. Francis, Sheraton-Palace, and Sir Francis Drake Hotels, San Francisco. Society headquarters, 29 W. 39th St., New York.

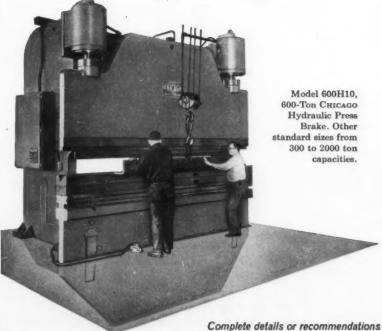
(Continued on P. 16)

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Straight-Side-Type Presses
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Atlas cars like the 75-ton ore transfers above are built to the individual load and schedule of each user. This custom engineering method, with matching care in manufacturing, assures dependable service incorporating all approved personnel safety features.

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ATLAS CAR & MFG. COMPANY 1140 IVANHOE ROAD CLEVELAND 10, OHIO

EXHIBITS, MEETINGS

(Continued from P. 15)

Association of Steel Distributors, Inc.—Annual convention, Feb. 15-21, The British Colonial Hotel, Nassau, Bahama Islands. Association headquarters, 29 Broadway, New York 6, N. Y.

American Management Assn.— Mid-winter personnel conference, Feb. 16-18, Palmer House, Chicago. Association headquarters, 1515 Broadway, New York 36.

Malleable Founders' Society— Technical & operating conference, Feb. 18-19, Park Manor Hotel, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland 14.

Alloy Casting Institute — Winter meeting, Feb. 26-27, Boca Raton Hotel, Boca Raton, Fla. Institute headquarters, 286 Old Country Rd., Mineola, N. Y.

MARCH

Steel Founders' Society of America
—Annual meeting, Mar. 9-10,
Drake Hotel, Chicago. Society
headquarters, 606 Terminal Tower,
Cleveland.

International Acetylene Assn.—Annual convention, Mar. 9-10, Hotel Roosevelt, New Orleans, La. Association headquarters, 30 E. 42nd St., New York 17.

Fire Equipment Manufacturers Assn., Inc.—Annual meeting, Mar. 11-12, Barbizon-Plaza Hotel, New York. Association headquaters, 759, One Gateway Center, Pittsburgh.

Pressed Metal Institute — Annual spring technical meeting, Mar. 11-13, Pick-Congress Hotel, Chicago. Institute headquarters, 3673 Lee Rd., Cleveland 20.

Society for Non-destructive Testing, Inc. — Western regional convention, Mar. 16-20, Ambassador Hotel, Los Angeles. Society head-quarters, 1109 Hinman St., Evanston, Ill.

4-HIGH 2-STAND TANDEM TEMPER PASS MILL



For Accuracy In Your Spring Steel



Feeler Gages are used as a *standard* of accuracy—good reason why so many of them are made from Uddeholm spring steel. Their own tolerance limits are extremely close—and feeler gage manufacturers have long depended on Uddeholm to supply this accuracy.

Uddeholm feeler gage steel is typical of the quality you can expect from *all* Uddeholm spring steels—not only in dimensional accuracy, but in superior flatness, straightness of edge, and surface and edge finish. In performance too, Uddeholm spring steel will give your product longer life, greater fatigue resistance.

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Uddeholm spring steels are available annealed or hardened and tempered in a wide variety of grades, sizes, tolerances and finishes. Widths run from $\frac{1}{8}$ " to $16\frac{1}{4}$ "; thicknesses from .001" to .125". Slitting, edge-filing and heat treating facilities are also available at warehouse.

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Rule Steel
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Textile Steels
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DETROIT: Warren H. Nugent, 17304 Lahser Road, KEnwood 5-6340

PHILADELPHIA: Frank T. Campagna, 1418 Walnut St., PEnnypacker 5-2114

PITTSBURGH: Lohmeyer Steel Co. 345 Mount Lebanon Blvd., LOcust 3-0122



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The MIGet carries its own drive rolls and one-pound reel of .030", .035", 3/64" or 1/16" aluminum wire; or two-pound reel of .030", .035" or .045" hard wire. Feed speed to 900 inches per minute . . . 200 amperes. DC. Air cooled. Gun, without reel, weighs about three pounds. Control cabinet, 17 pounds. Here is *THE* gun for shortlength welds in hard-to-get-at places.

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AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT • Products of the divisions of Air Reduction Company, Incorporated, Include: AIRCO — Industrial gases, welding and cutting equipment • AIRCO CHEMICAL — vinyl acetate monomer, vinyl stearate, methyl butynol, methyl pentynol, and other acetylenic chemicals • PURECO—carbon dioxide—gaseous, welding grade CO₂, liquid, solid ("DRY-ICE") • OHIO—medical gases and hospital equipment • NATIONAL CARBIDE—pipeline acetylene and calcium carbide • COLTON—polyvinyl acetate, alcohols, and other synthetic resins.

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can improve your steel tubing profit picture!

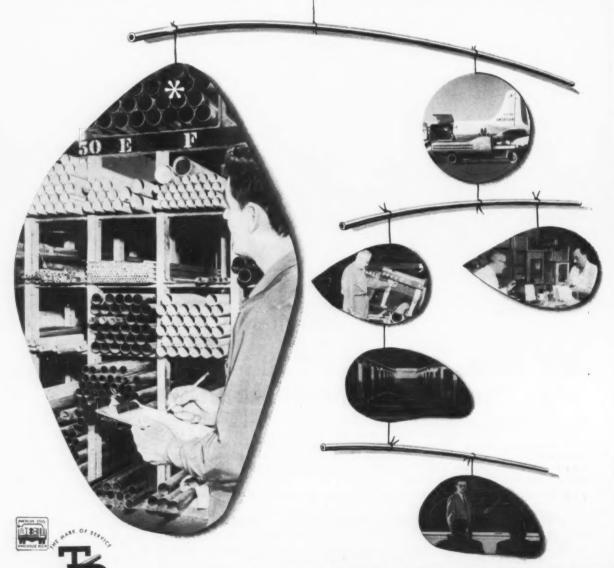
Important? Of course. If you buy steel tubing regularly, you can improve profits by cutting production costs, handling and inventory costs, minimizing your inventory investment...without paying a premium, when you buy in warehouse quantities.

- Personalized Inventory Plan custom-tailored to your requirements*.
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*PERSONALIZED INVENTORY PLAN CUSTOM-TAILORED TO YOUR REQUIREMENTS! A reserve of tubing is held in your name—at no additional cost. TD inventories, handles and ships it, according to your scheduled requirements—as a customer service. You invest no money, take no risks, and pay nothing extra for this exclusive service.

Call TD for-stainless, alloy and carbon steel tubing, both aircraft and commercial quality.

Write Dept. 1-24 today for your copy of "Eighteen Ways to Save Money in Your Steel Tubing Purchasing," and the name of your nearest TD representative.



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Breek TUBY



Sonic testing, employing high-frequency sound waves, is one of several methods for detecting internal flaws in steel. Above, an open die-forged shaft is being sonic tested prior to shipment for use in a gyratory crusher.

Quality control—a vital activity at Standard Steel Works

Every conceivable shop and laboratory test required for modern quality control can be performed by Standard's staff of metallurgical technicians. Testing of incoming raw materials for undesirable elements, testing of finished product for minute quantities of gas, ultrasonic, X-ray and microscopic examination, and tests for dimensional integrity are but a few of the routine checks which assure that the finished, delivered product will meet the most rigid specifications. Write Department 1-B for full details.

Standard Steel Works Division

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NEW HIGH CAPACITY!

NEW SMALL SIZE!

MANY NEW SAVINGS!

Dyna-V is entirely new. In every detail, Dyna-V has been engineered to take advantage of today's great improvements in belt materials and metal alloys—resulting in V-belt drives that are sensationally compact.

Dyna-V is capable of handling up to three times as much horsepower in a given space. Dyna-V opens vast new possibilities for better, more economical machine design. And, in most instances Dyna-V costs less!

An entirely new high in strength and horsepower capability is packed into Dyna-V Belts. Cross section dimensions are substantially reduced—top width is much narrower. Dyna-V Sheaves are designed for these belts. Narrower grooves reduce face width—and weight. Costs are lowered. Smaller diameter sheaves and shorter center distances multiply savings.

Increased sheave strength for increased capacity is obtained through changes in design that utilize the full benefit of modern improvements in alloy metals. Dodge is noted for the superiority of its semisteel castings, to which now have been added ductile iron castings produced with the most modern electric furnace facilities.

Dyna-V Sheaves are equipped with Taper-Lock Bushings. The superiority of this mounting, patented by Dodge, is widely recognized. TaperLock's holding power is terriffic, yet it is "easy on, easy off." And Taper-Lock Bushings provide the additional advantage of interchangeability.

The benefits of Dyna-V go beyond compactness and initial low cost. Smaller sheaves reduce shaft overhang—increase bearing life. The dimensional stability of Dyna-V Belts (which are heat resistant, oil resistant, static conducting) solves the problem of belt matching. Every belt carries its full share of the load. The crowned top of Dyna-V Belts is a new concept in belt design. Combined with proved concave sidewall construction, it insures perfectly even load distribution between belt and sheave.

A complete bulletin on Dyna-V, including drive selection tables, will soon be ready. If you want one of the first copies, write us at once. Or see your local Dodge Distributor.

DODGE MANUFACTURING CORPORATION 800 Union Street, Mishawaka, Indiana



DODGE DYINA CONVENTIONAL TAPPER-LOCK PRIVE DYNA-V TAPPER-LOCK DRIVE





Dyna-V Drives for capacities up to 50 horsepower are now available from stock, using the new belt cross section, "3V," and Dyna-V Taper-Lock Sheaves to match.

Dyna-V Drives for capacities up to 200 horsepower, using "5V" belts and sheaves will be available from stock in March. Larger sizes up to 1500 hp, with "8V" belts and sheaves, can be furnished on order.

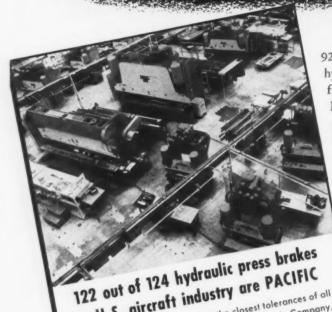
COMPARISON, ILLUSTRATED ABOVE - 3 HP, 1750 RPM, 2.41 TO 1 RATIO

	BELTS	LTS	SHEAVES			CENTER		WEIGHT	COST		
	Number	Size	O.D. Driver	O.D. Driven	Width	TANCE	HP	(LBS.)	Per hp	Per Drive	
CONVENTIONAL TAPER-LOCK DRIVE	3	A42S	4.15"	8.95"	21/2"	12.3"	4.62	24.7	\$5.91	\$27.38	
DYNA-V TAPER-LOCK DRIVE	2	3V400	3.35"	8.00"	11/2"	10.8"	5.0	18.0	\$4.50	\$22.50	
% SAVING Savings vary with different sized drives			19%	10%	56%	12%	+	27%	23.8%	17.8%	

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the white pages of your telephone directory for "Dodge Transmissioneer."



,769 years to arrive CCURATE HYDRAULIC



in U.S. aircraft industry are PACIFIC Aircraft manufacturers work to the closest tolerances of all industries in metal forming. Douglas Aircraft Company, Tulsa, Oklahoma, with 8 Pacific Brakes (above) is typical of the airframe manufacturers who have selected Pacific

tor its precise accuracy.

tons to 1500 tons.

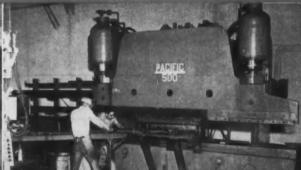
924 PACIFIC Brakes, representing over 95% of all hydraulic press brakes in use today, have operated for an aggregate of 4,769 years to test and confirm PACIFIC designs that have established hydraulic press brakes as far more profitable to operate than mechanical brakes. However, only PACIFIC has precise accuracy, versatility, high speed and dependability that comes from years of experience in manufacturing, developing and improving this unique machine. It is the only hydraulic press brake in daily operation that is actually air bending, straightening, deep drawing, blanking, and doing heavy punching. Accuracy within thousandths of an inch (greater than with any mechanical or other hydraulic brake) repeats itself on every stroke. Ram remains level regardless of location of work on the bed. PACIFIC sizes range from 60

HYDRAULIC



Only hydraulic brake built for HEAVY PUNCHING

Pacific is uniquely designed to absorb heavy shock from punching in the hydraulic system rather than in the frame of the brake. Cushioned against shock, punch and dies stand up from 3 to 8 times longer than with mechanical brakes. Photo (above) shows 1^{σ} alloy steel plate being punched at earthmoving equipment plant.



Dependable, simplified electrical and hydraulic controls can easily be kept working continuously by any plant maintenance crew. There are no complicated electronic devices. In photo (above) at agricultural equipment plant, the 500 ton Pacific Hydraulic Brake shearing %" alloy steel plate with Pacific Shearing Attachment has operated continuously for the first 4 years at a cost of \$5.22 in replacement parts.

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PLANTS:

OAKLAND, CALIF. and MT. CARMEL, ILL.

HIGH SPEED operation

Pacific adjustable stroke length can be shortened for rapid stroking. Automatic, self-leveling ram permits use of progressive dies across entire bed of press. The automatically-fed Pacific at automative parts plant, which can cycle up to seventy 1½" strokes per minute, is forming 3780 operations per hour in the above photo. In virtually any operation, Pacific's high cycling speed equals or exceeds materials handling capacity.

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rigid specifications

Tension tests are required to be made at room temperatures and at 670° F. The following minimum physical properties shall be met:

At Room Temperature:

TS YS EL RA CHARPY V-NOTCH
70,000 30,000 45 50 50

At 670° F. the minimum tensile strength shall be 51,000 p.s.i. and the minimum yield strength 18,300 p.s.i.

Rejection

Each casting that develops unacceptable defects during shop working or fails to conform to all of the requirements of these specifications shall be rejected. No repair by welding or other means will be permitted.

All cast pipe shall be hydrostatically tested to 5,900 p.s.i. and held at that pressure for 20 minutes with zero pipe leakage. Each length of pipe shall be hydrostatically tested at the manufacturer's plant.

Radiographic Inspection

- (a) Paragraph S5 (a) of the Supplementary requirements of ASTM-A 362-52T.
- (b) All castings shall be radiographed 100% and shall conform to ASTM-E7 1-52, Class 2 quality, except as modified by these specifications.
- (c) The manufacturer shall establish a positive system of identification of the X-ray plates which shall be subject to approval by the inspector. This system shall guarantee complete coverage by radiographing and provide for positive identification between the plate and the subject.

Inspection of Penetrants . .

All castings shall be subjected to inspection by fluorescent penetrants or penetrating dyes both inside and out. All cracks, porosity, or flaws revealed as a result of the Dye Penetrant Test shall be due cause for rejection of the casting.

The 304L stainless steel shall conform to the following ladle analysis:

.03 max. Carbon 1.50% max. Manganese .03% max. Phosphorous Sulphur .03% max. 2.00% max. Silicon 21.00% Chromium 18.00 8.00 11.00% Nickel

Pipe: All pipe of the following sizes shall be centrifugally cast stainless steel as per ASTM-A 362-52T, except as modified by these specifications:

> 16" - Sch. #160 12" - Sch. #160 10" - Sch. #160 8" - Sch. #140

All pipe shall be machine finished to 125 micro-inch interior and exterior.

for nuclear piping met by U.S. PIPE metal mold process

Centrifugally Cast Stainless Steel Solves Many Piping Problems

Combinations of temperatures, pressures and corrosive conditions never encountered before: these are among the piping problems that must be overcome by the men who design the nation's nuclear power installations.

Stainless steel centrifugally cast pipe provides many of the answers. Study the specifications at the left . . . specifications demanded of stainless steel pipe on a recent job for Paul Hardeman, Inc., Los Angeles, California. This pipe is being used for heavy duty, high pressure, elevated temperature service in the primary piping system of the SPERT-III Reactor at the U.S. Atomic Energy Commission's National Reactor Testing Station near Idaho Falls, Idaho. The Stearns-Roger Mfg. Company, Denver, Colorado, is the architect-engineer on this project. A complete tabulation of the actual test data obtained on this pipe and to this specification is available upon request.

U.S. Pipe is headquarters for metal mold centrifugally cast alloy and stainless steel pressure pipe over a wide range of special and standard analyses-in large and small quantities-and to individual specifications.

If piping of the type described above is the bottleneck in your nuclear power planning, write and outline the problem.



Steel and Tubes Division

You just roll this sealer on! 3M Ribbon Sealer EC-1202



ROLL-ON RIBBON SEALER EC-1292 creates a uniform, economical, durable seal that shuts out water, dust and moisture.

It's easy to shut wind and weather out of mobile homes with 3M Sealer EC-1202. You just roll this synthetic rubber ribbon on, apply the next piece of metal . . . and fasten mechanically right through the sealer.

Because it's fabric-reinforced, EC-1202 holds its shape, doesn't stretch,

sag or shrink. It applies just as easily along curved surfaces.

In mobile homes, this roll-on ribbon makes a weather-tight seal at lap seams and window beddings. And EC-1202 serves boats, curtain walls, commercial refrigeration, too. It's available in various widths and thicknesses

direct from your local jobber.

Consult 3M Research. Contact your 3M Field Engineer. Or for information and free literature

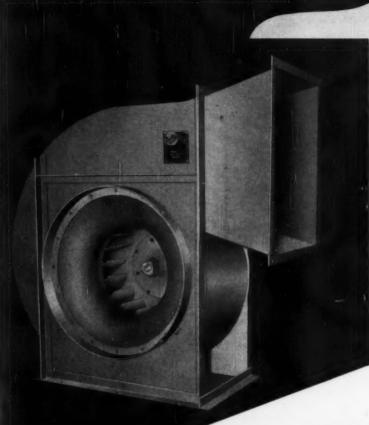
write: A.C.&S. Division, 3M,Dept.YP-29,900Bush Ave., St. Paul 6, Minn.



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MINNESOTA MINING AND MANUFACTURING COMPANY
... WHERE RESEARCH IS THE KEY TO TOMORROW





Widely-used in rugged steel mill applications, the "Buffalo" Type "CR" Radial Blade Fan is unsurpassed for dependable and longlasting service under the most severe industrial conditions.

The "CR" is unique in the fact that the same design principles which reduce wear actually increase the efficiency of these husky fans. An engineering refinement of the radial blade principle — plus a new high in streamlining the entire fan, from inlet through wheel to outlet — boosts performance at the same time that it cuts down wear. (See drawings at left.)

Add to these wear-resistant design principles the long-standing "Buffalo" tradition of heavy-duty reliable

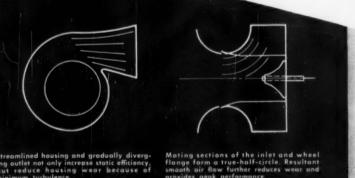
"Buffalo" Type "CR" Radial Blade Fan

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DESIGNED FOR PERFORMANCE UNDER DEMANDING CONDITIONS



construction features, and you have an unbeatable combination of factors contributing to maximum efficiency and minimum wear.

Investigate this high performance fan, designed for severe industrial service. Ask your nearby "Buffalo" Engineering Representative for full details on the "CR", or write for Bulletin FD-205.

Every "Buffalo" Fan features the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

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BUFFALO, N.Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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Buffalo Pumps Division, Buffalo, N.Y.



3 WEEK DELIVERY

TRUSCON "Budget-Buildings"

Truscon Steel "Budget Buildings" are the fast, economical way to provide warehousing, enlarge manufacturing facilities, erect field offices at lowest cost. Available with 3-week delivery from order to job site!

Basic framework is of rigid frame design, shop fabricated from hot rolled structural sections, complete with all necessary connection plates and anchor bolts. Purlins and girts are cold formed channel sections, bolted with standard machine bolts.

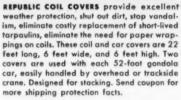
Roofing and siding are 26-gage galvanized roll formed ribbed sheets 24" wide, and in continuous lengths.

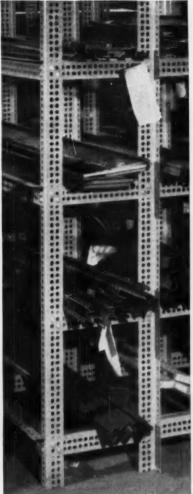
Sheets are rolled from Republic tight-coated, continuous hot dip galvanized steel . . . will not flake, crack, or peel. More rust resistant than ever and no painting needed.

Truscon "Budget Buildings" are available in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any lengths necessary. All roofing, siding, windows, doors, and hardware are shipped to the job site as a package.

To learn more, call your Truscon representative, or write for attractive, full-color brochure.







REPUBLIC METAL LUMBER® saves time, space, and money! Precision engineered system of short slots placed to allow ¾" vertical and horizontal adjustment, offers unlimited applications. Simply measure, cut, assemble. Bonderized to resist rust and damage; baked enamel finish. Delivered in bundles of 10 angles, .080 gage or .104 gage, 10- or 12-foot lengths, bolts and nuts included. Stores in space of one 2" x 4" piece of lumber. Send coupon for idea-packed catalog.



REPUBLIC STEEL LOCKERS offer clean, attractive, dress-wash-change facilities. Interiors are spacious, well designed for convenience and ventilation. All furnaces are Bonderized to resist rust, retard corrosion, and provide better paint adhesion. Finish is baked enamel. Positive locking, heavy-duly steel construction assure protection of personal effects and tools. Call your nearest Republic representative, or send coupon for data, prices, and delivery.

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World's Widest Range of Standard Steels and Steel Products REPUBLIC STEEL CORPORATION DEPT. IA-6526 R

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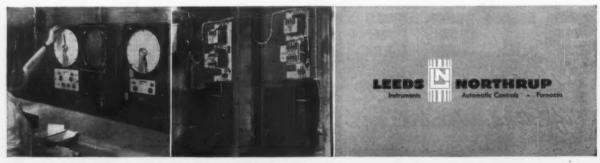
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Fansteel Metallurgical Corp.: Operator loads sintering furnace with trays of FASTELL® heavy duty electrical contacts.

Critical sintering temperatures a problem?

Not at Fansteel Metallurgical Corp., where Speedomax® H is regulating moly heaters and simplifying control of critical sintering temperatures. With temperature dependent upon load density and compact composition, Fansteel depends upon experience for the right temperature . . . upon Speedomax H for control reproducibility. Rugged, compact and completely reliable, this controller continuously regulates power input to moly heaters . . . holds furnace temperature well within specified limits. Speedomax H is providing the same dependable control on numerous heat treat processes . . . is helping produce both process economies and a quality product. Whatever your heat treat, it'll pay you to investigate Speedomax H! For details, contact your nearest L&N office or write 4956 Stenton Ave., Phila. 44, Pa.



"H" C.A.T. control brings furnace from 900 to 1300 C in 16 minutes without overshoot or hunting. Magnetic amplifiers are conveniently mounted on panel back.

Each year, thousands of gallons of wornout emulsions go down the drain

With them go millions of dollars that could be saved by controlling bacteria like these Pseudomonads

less emulsion waste!

ELCIDE 75 IS A POWERFUL COMBINATION of Sodium o-phenylphenate and Sodium Ethylmercuri Thiosalicylate (Thimerosal) . . . related to one of the safest, most effective bacterial inhibitors used in the exacting field of medical surgery. Its double action controls a much wider range of bacterial growth than the commonly used germicides and employees and machinery.

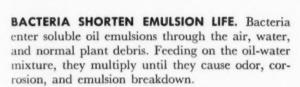
"additives"; yet Elcide 75 is completely safe to JUST ONE OUNCE OF ELCIDE 75 ADDED TO

EACH FOUR GALLONS OF STANDARD DUTY

- SOLUBLE OIL EMULSION . . . 1. Lengthens emulsion life.
- 2. Reduces soluble oil requirements.
- 3. Reduces downtime for recharging.
- 4. Decreases disposal of waste-oil.
- 5. Preserves emulsions during extended shut-
- 6. Lessens bacterial health hazards.
- 7. Reduces bacterial corrosion of machinery and products.

If your company is not one of the many plants now using Elcide 75, we suggest you try it soon. Your own cost analysis should convince you of its value.

Now, ELCIDE 75 controls bacteria...prevents need-



WHEN EMULSIONS GO SOUR, COSTS GO UP. The machine has to be shut down, losing production and valuable time. Costly labor is required for the clean-out, recharging, and disposal of the waste emulsion. Additional soluble oil is needed, adding to the total cost of frequent recharging.

BACTERIAL PLATE COUNTS PROVE ELCIDE 75 INCREASES EMULSION LIFE. The light areas below are bacterial colonies that ruin soluble oil emulsions. The left plate shows the untreated emulsion. The center plate is the same emulsion treated with a popular germicide. The right plate proves Elcide 75's double control keeps emulsions clean and usable...as much as 51/2 times longer by actual plant tests.





Emulsion treated



Elcida 75

PRODUCT SPECIFICATIONS ELCIDE 75

(Lilly's brand of bacterial inhibitor for cutting fluids.) Active Ingredients - Sodium Ethylmercuri Thiosali-

cylate (Thimerosal) and Sodium o-phenylphenate.

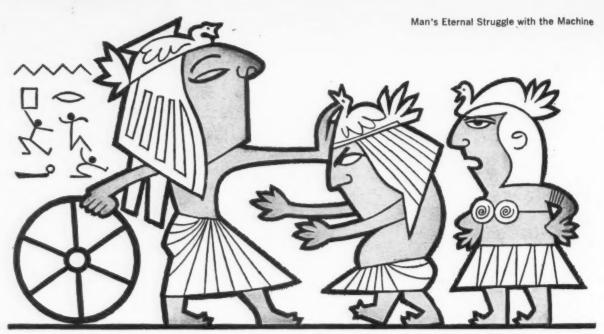
1-gallon (4 per case) polyethylene . . . \$8.50

Sold only through selected distributors.



KEEPS COOLANTS FRESH AS A DAISY!

AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION . INDIANAPOLIS 6, INDIANA



BUSINESS IS UNUSUALLY COMPETITIVE TODAY AS OPERATING COSTS ARE RISING AND PROFITS SHRINKING

Did you ever meet a vendor who wouldn't sell you the equipment you wanted?

Just "meeting" such a vendor is not enough.

If you haven't always had vendors who refuse to supply unsuitable equipment, you've been getting something you don't need.

If you haven't always had vendors who are dedicated to advancing your manufacturing technology, you're getting less than you must have.

Your responsibility for devising production processes and selecting equipment is greater than ever. You no longer have time to "hand-feed" any equipment builder's design and manufacturing operations.

Yet, you can't afford to install anything other than what is right. Because, if your production methods aren't keeping pace with your competitors', you're already starting to go out of business.

Sciaky knows these facts of business life. To Sciaky, it is obvious that the cost of always having to make new sales to new customers is far greater than the cost

of a long term relationship of trust based on fulfilling your requirements. That's why Sciaky refuses to sell resistance welding and production equipment which is unsuitable for the user's needs.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

Many manufacturers are taking that advantage. As a result, men just like you are enjoying the full vendor support necessary to steadily improving their company's manufacturing operations. When Sciaky analysis of their requirements sometimes indicates that Sciaky equipment is not suitable, the recommendation for "no change" is immediate. Thus, Sciaky builds the foundation of trust necessary to your success.

The bulletin, "Resistance Welding At Work" contains many factual descriptions of interesting applications of the Sciaky technique. Write and advise of your field of interest.



67 A

SCIAKY BROS., INC., 4923 W. 67th STREET, CHICAGO 38, ILLINOIS . POrtsmouth 7-5600

Thousands of rivets or blanks for cold headed Brainard Specials are produced in only minutes (3½ million pieces daily) on this battery of modern cold headers from Youngstown Rivet Quality Wire.



Accent on excellence Youngstown solid rivet wire



Brainard Rivet Company of Girard, Ohio, daily produces rivets "by the millions". But they realize a rivet is only a rivet—so quality and fast, dependable service are the products they're really selling.

To help in maintaining Brainard's high product quality on a steady, dependable production basis is Youngstown's Solid Rivet Quality Wire. It is free of all injurious seams and inclusions which guarantees long, trouble-free production runs on Brainard's cold headers.

Wherever steel becomes a part of things you make, the high standards of Youngstown quality, the personal touch in Youngstown service will help you create products with an "accent on excellence".



THE

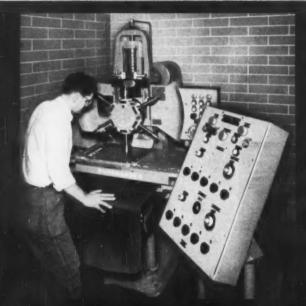
YOUNGSTOWN

SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

Drilling Time Reduced 50% 12 BURGMASTER tape controlled 6

with automatic numerical ta



The Burgmaster G. E. Tape Controlled Turret Drill is installed in an air-conditioned dark room for exposing the film for making etched copper circuit boards. The tape reader and control cabinet are mounted outside the dark room.



Programming and Tape
Preparation Manufacturing personnel transpose
drawing decimal dimensions to a program sheet
including feeds, speeds,
spindle sequence, and
any auxiliary functions. A
typist then prepares the
standard eight-hole

punched tapes in a matter of minutes and checks it for accuracy from a typed tape produced at the same time. Duplicate tapes can be produced in seconds automatically, and new instructions (representing design changes) can be spliced in at any point.

General Electric Company, Phoenix, Arizona, Computer Department, not only cut drilling time 50% in manufacturing printed circuit boards, but actually eliminated 124 expensive fixtures that would have cost six times the machine investment. Approximately 2400 holes of three sizes are drilled in 124 different panels at the rate of 15 to 20 holes per minute, holding ±.002* tolerances between holes.

Burgmaster Plays a Double Roll

Not only is the Burgmaster Tape Controlled Turret Drill used for drilling the panels, but it is also used for exposing the film from which the etched circuit board is made. Computer engineering techniques were used to determine wire tables—the least distance of wiring runs—for programming a punched tape for exposing the negative automatically on the Burgmaster, using a light source as a tool on the turret, and finally, for programming the punched tape for drilling the holes automatically. This unique manufacturing and engineering method greatly reduced the engineering time, and lead time to get into production, in addition to cutting machining time 50%. No complete engineering drawings were required for making expensive tooling and it was estimated that three engineers did the

JOB FACTS:

Machine.		Tape Controlled
	6 Spindle Drill.	

Parts	124 Different Etched Co	pper Circuit Boards	
Material	Conp	er Clad Froxy Glass	

Operations Drill .029, .052, and .193 Holes

Rate of Drilling ... 15 to 20 Holes per Minute—3 Shifts No. of Holes Approximately 2400 per Panel

Fixture Simple Clamps, Corner Location

Specialists in High Production Turret Drilling



1C Menual Power Index



2B Manual Power Index 34" Capacity



2BF Flange Mounted Power Index 34" Capacity



2BH Automatic Hydraulic 34" Canacity



3BH Automatic Hydraulic



2BR Ram Type Radial Drill



15" x 26" x .093" Thick

28HT — 3BHT Automatic Tape Controlled 34" and 132" Capacity

work o

The ar Standa tapping autom machin duce a ple hol control speeds, rapid a control numeri spindle on two are per operati withou as desi out at

> Alterna cost \$1 Saving Fixture

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Write master trolled Boring sound Turret from a

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76 124 \$1500 Fixtures Eliminated 6 Spindle Turret Drill

al table positioning control

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Maximum Flexible Automation

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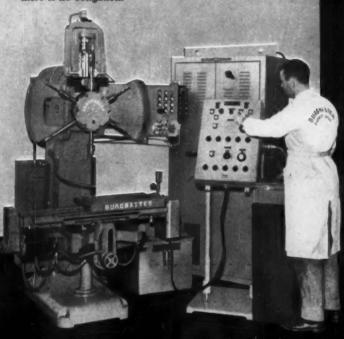
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ation

The application of G.E. Numerical Controls to either nels Standard Burgmaster 6-spindle or 8 spindle turret drilling, tapping and boring machines results in maximum flexible automation. That is, these field proven Burgmaster machines can be quickly and economically set up to produce a large variety of parts using standard tools and simple holding clamps. The standard adjustable Burgmaster Controls are maintained...including pre-selective spindle speeds, infinitely variable pre-selective feeds, selective rapid approach and return, skip indexing, precision depth control, and simple manual controls for set-up. The G.E. numerical system controls all machine functions, selects spindles in any sequence, automatically positions the table on two axes, clamps the table while machining operations are performed, and controls coolant. Up to six different in the control of the operations can be performed at any command position uced without moving the table, or as many cycles using one tool tion, as desired, without indexing. All operations are carried out at their most efficient rate for high finish, precision, speed, and longest tool life. As a result one man can operate two or more machines on many jobs, or by attaching two tapes together one part can be machined on one end of the table while work is being set up on the other to effect constant machine operation.

The savings that can be realized from Automatic Tape Controlled production on small lots or high production is tremendous. Why not get all the facts on your work? There is a Burg direct representative or dealer near you. Call him -there is no obligation.



This is a general view of the entire automatic manufacturing unit comprising the Burgmaster 6 Spindle turred drill, G.E. tape control unit, control cabinet and tape reader. Price, \$29,000 complete. G. E. Tape Control can also be applied to the Burgmaster 8 Spindle Turret Drills. Capacities are 3/4" and 11/2" in steel, tables 10" x 18" and 18" x 30". Larger automatic positioning tables also available.

Alternate Method Using Expensive Drill Jigs (Estimated cost \$1500 ea.) and Semi-Automatic Multi-Spindle Drills.

Savings 50% Reduction in Drilling Time-124 \$1500 Fixtures Eliminated, 3 Engineers Instead of 30 Using Computer Techniques-greatly reduced lead time.

Write for Bulletin describing Burgmaster 6 and 8 Spindle Tape Controlled Turret Drilling, Tapping, and Boring Machines, Thirty-minute 16mm sound film showing all Burgmaster Turret Drills in operation is available from any office without charge.



MANUFACTURING COMPANY, INC.

15001 South Figueroa Street, Gardena, California **FAculty 1-3510 DAvis 9-4158**



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Plus dealer representatives in other industrial centers.





Superior weighs a wall to "zero in" on your tubing tolerance

Weight control gives precise check of tubing dimensions to help your product performance

*These delicately balanced scales weigh a length of tubing accurately to within 1/1000 lb. The relationship of weight to length and to OD tells us how closely the tubing wall or ID conforms to specifications. This fast, precise method of checking average wall or ID enables us to provide you with a tubing order whose overall uniformity is unusually high. In certain applications, tubing produced by this weight control method can materially improve performance for you. It results in minimizing variations in your product caused by tubing whose average wall or ID varies too widely from the required design mean.

This is but one of many modern tools and techniques that help improve the already high quality of Superior small tubing.

Our premium quality small tubing is offered in a range of analyses (over 120) unsurpassed in the industry. Included are stainless, carbon and alloy steels, nickel and nickel alloys, beryllium-copper, titanium and zirconium—and 16 different Super Alloys. Our range of sizes and shapes is equally extensive.

Special services include statistical quality control, pilot and test lot sampling and melting, dye penetrant inspection, ultrasonic and hot tensile testing, eddy current and X-ray inspection, specification services—and field specialists who will call on you at your request.

For handy reference in your files, get a copy of Bulletin 40, "Selection and Application Guide for Superior Tubing." Write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

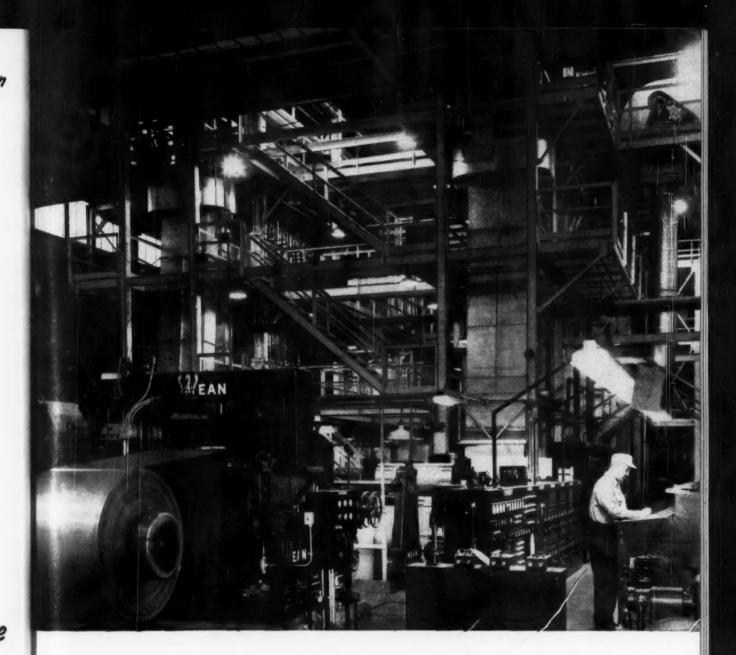
Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to % in. OD-certain analyses in light walls up to 21/2 in. OD

West Coast: Pacific Tube Company • 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331



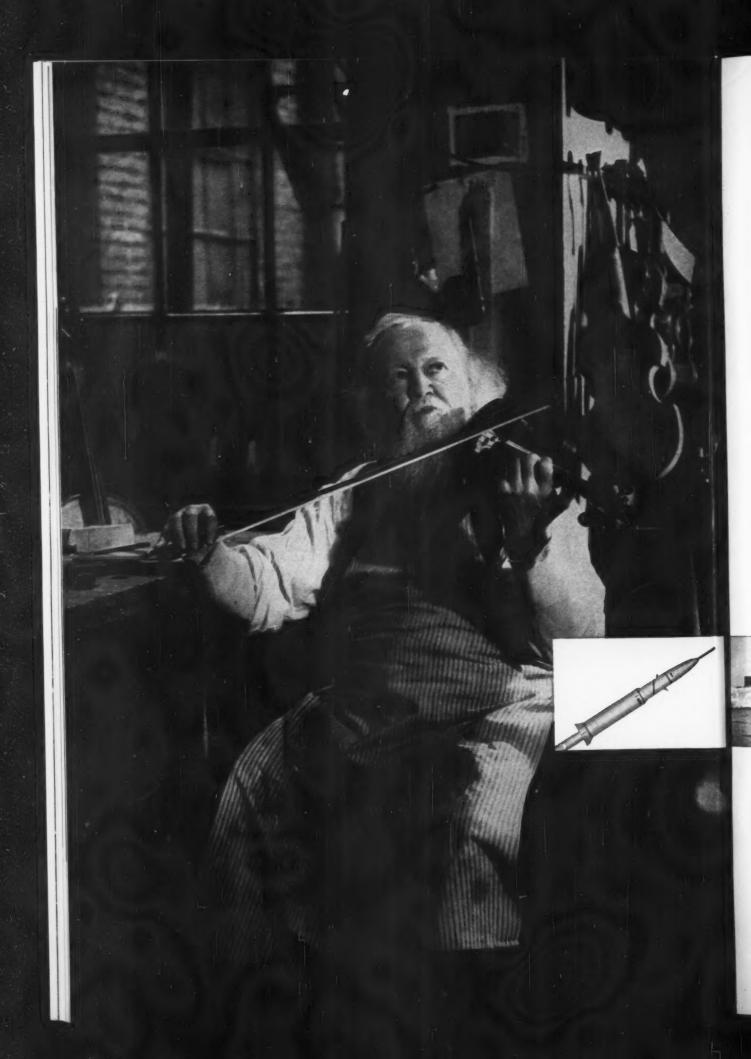
Wean continuous strip annealing lines... the standard of quality the world over

Wean built equipment for the first continuous strip annealing line and, since that pioneer installation, has helped develop equipment for all types of continuous annealing: tin plate, silicon steel and stainless steel. In close working partnership with the steel industry, Wean has designed and built more annealing lines than all other builders combined.

This leadership is typical of the specialization that has made Wean the standard of quality for sheet, strip and tin plate processing equipment. This specialized experience is at your service.



THE WEAN ENGINEERING COMPANY, INC. . WARREN . OHIO



timbre tester

Steels, like men, have different personalities. Years ago this mysterious something in steel was referred to as "body", "nature", or "character" . . . until 1930, when Carpenter researchers, borrowing a term from music, called it timbre.

Today, timbre is the common term steel men use when they refer to the still-mysterious but now-controllable property of tool steels, that determines grain size and toughness.

It was only natural that Carpenter's designation received immediate and general acceptance. For by that period in 1930, Carpenter was firmly established as a pioneer in the research and development of fine quality steels.

For many years, demands by American industry for Carpenter-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was quality, the pioneering of new and better steels, rather than quantity..

Within the past year, we have doubled our ingot tonnage capacity. Today, as the result of long-planned expansions, we can offer quantity along with famous Carpenter quality. For the first time, both are now available. And both will continue to be available . . . even in times of peak demand.

While quality will continue to remain a sacred Carpenter watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest steels.

Carpenter will continue to meet the timbre test.



tool and die steels

stainless steels

arpenter stee

electronic and magnetic alloys

special-purpose alloy steels

valve, heat-resisting and super alloy steels

tubing and pipe

fine wire specialties

The Carpenter Steel Company Main Office and Mills, Reading, Pa. Alloy Tube Division, Union, N. J. Webb Wire Division, New Brunswick, N. J. Carpenter Steel of New England, Inc., Bridgeport, Conn.



THE ALL NEW CLEARING-AXELSON

- The Lathe that Makes

 All Others Obsolete
- A Startling New Concept in Lathe Design

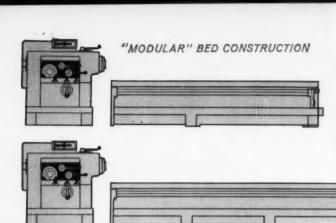


The new Clearing-Axelson is not just a face-lifting relesign. Rather, it is a completely new approach to lathe lesign and construction. Historically, lathes have been lesigned around cast beds with the headstock placed in top of the bed. In the new Clearing-Axelson, the leadstock is a complete unit, built to the floor. The bed is a complete unit built to the floor.

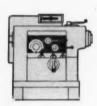
onstruction is welded steel—far stronger than cast iron,

and much more suitable for the addition of accessory tooling.

Performance? There has been nothing like it since lathes were first developed. The features shown here are just a part of the story. When you have seen this machine, you will know you have seen the future in engine lathe design . . . the Clearing-Axelson.

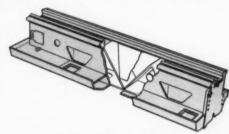


Beds are keyed and bolted to the headstock. The bearing surfaces are machined to guarantee rigid accurate alignment of bed, headstock and spindle, assuring precision and interchangeability. If at a later date you need a longer or different style bed, you needn't buy a new lathe—just order a new bed. Here is the building block concept—no problem of obsolescence!



"MODULAR" HEADSTOCK CONSTRUCTION

The headstock is a modular assembly in which both the main drive and the feed box may be easily removed as units by a simple disassembly. Never before has it been easier for the user to change the entire speed or feed range of a lathe. Never before have spindle, drive and feed components been so readily accessible for economical maintenance and servicing.



ALL STEEL WELDED BED-18 TIMES STRONGER THAN CAST IRON

Stronger homogeneous steel plate provides strength where it is needed—with none of the limitations of cast iron design. Pyramid shaped reinforcing ribs are used the entire length of the bed for high torsional rigidity.





Clearing, division of U. S. Industries, Inc. also manufactures power presses of all types, dies and special tooling, and special equipment for the aircraft and missiles industry.



USi Clearing

DIVISION OF U.S. INDUSTRIES, INC.

6499 W. 65th Street • Chicago 38, Illinois



"We've cut delivery time 75%"



"U. S. Steel Supply's prompt deliveries help us keep this drop forge hammer busy."

"On one day's notice, U. S. Steel Supply furnished us with 80,000 pounds of hot rolled bars," says Mr. J. F. Armitstead, Shop Superintendent.



says Mr. W. M. Croft, California Drop Forge Company, Los Angeles, California

"Our normal delivery time used to be four or five weeks," says Mr. Croft. "Now, we offer 7-day delivery on orders, when necessary, because we're able to get the material we need from U. S. Steel Supply on an overnight basis.

"Recently, we faced this situation: One of our aircraft customers, through an accident, lost 65 parts from a 200-unit order; he notified us immediately, and we, in turn, called U. S. Steel Supply for the material. It arrived the next

day, and a week later the re-order was completed. Our customer was impressed!"

Why not take a close look at *your* steel buying policies—you'll find U. S. Steel Supply's booklet entitled "Value Analysis at Work" very helpful. Write to our Chicago Office, or call your nearest U. S. Steel Supply Steel Service Center. You'll find us in the Yellow Pages listed under *steel*.

USS is a registered trademark

U.S. Steel Supply Division of



United States Steel

Steel Service Centers and Complete Steel Strapping Service at: Baltimore, Birmingham, Boston, Chicage, Moline, Cleveland, Heuston,
Dallas, Les Angeles, Milwaukee, Newark, Southington (Conn.), Philadelphia, Seattle, Portland (Ore.), Pittsburgh, St. Leuis, St. Paul,
San Francisco. General Offices: 208 South La Salle Street, Chicage 4, Iil.

KNIVES STAY SHARP LONGER for California Steelweld Shear User



One of the big reasons why knives stay sharp longer on Steelweld Shears is the simplicity with which knife clearance can be adjusted for every plate thickness. It's merely a matter of turning a hand crank until the gauge pointer is on the proper figure. No bolts to loosen. No need of a feeler gauge.

"It's a shame," said the shop foreman at Stephens-Adamson Mfg. Co., Los Angeles, California, "but since installing our Steelweld Shear the knife-sharpening man has been crying because we have no work for him."

After months of continuous operation, eight hours a day, usually six days a week, inspection of cut pieces indicates the knives are practically as sharp as new. Parts cut have no burns and are straight and true. Even when the cutting edges of the knives finally become dulled, there are three more cutting edges ready for use as all four corners of each knife are prepared for shearing.

Stephens-Adamson like their Steelweld Shear and are happy over its operation. It plays an important role in the manufacture of screens, elevators and conveyors which are the principal products of this large West-coast plant. In their words, it is "heavy, well built and dependable. We know it is reliable and always ready to handle our work from day to day."



GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

4817 EAST 282ND STREET . WICKLIFFE, OHIO

STEELWELD PINOTED SHEARS



"True, some silicon products are 'cheaper' than others . . ."

... But the "cheaper" product may cost you more in the long run! Real economy and efficiency come only when the *right* silicon product is mated with the *right* application. Often, because silicon has so many different uses, it's not so easy to select the product that will give best results — at lowest final cost.

That's where your VCA representative comes in. He can be a real help in determining the ideal form and

type of silicon for the job you have to do. And the reason he's so well qualified is that VCA offers a complete line of silicon products — and knows its line! Get an impartial recommendation that can mean significant savings in your operations. Call your nearest VCA district office soon! Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. Chicago • Cleveland • Detroit • Pittsburgh

IF YOU DON'T HIT THE "BULL'S EYE"

...You Can't Win the Game!



High productivity is the one and only way to victory in today's intense competition in metalworking. This is the "bull's eye" you must hit in order to get lower pro-

HAS ALL THESE ADVANCED
FEATURES -- AND MANY MORE!

46" Electrically Controlled King® with Ram Head, Turret Head, Side Head

and Coolant Pan

You will be "on target" when you put your boring, facing, and turning jobs on the new King® Electrically Controlled Vertical Boring and Turning Machine: This new King is designed and built to bring boring mill users advanced, vitally-essential competitive advantages—in faster set-up... faster operation... higher, uniformly maintained accuracy... greatly increased productivity.

duction costs with resultant maximum profit.

Full electrical control cuts manipulation time to a bare minimum in both set-up and operation. Increased horse-power and expanded feed and speed ranges cut machining time and provide greater job versatility. Extraheavy rugged construction and simplified design assure exceptionally low maintenance cost.

To "hit the bull's eye" of profits on your boring, facing, and turning operations, see your authorized King Distributor, or write us direct.

- COMPLETE ELECTRICAL CONTROLS conveniently located on movable pendant station and machine-mounted panel.
- INCREASED HORSEPOWER—40 and 50 H.P. on 30", 36", and 46" sizes, 75 and 100 H.P. on sizes 56" and up—available in any one of three speed ranges.
- EXPANDED FEED AND SPEED RANGES—24 feeds from .0016" to .250" per revolution, 24 speeds in any one of three standard ranges—low, intermediate, or high.
- DIALS FOR PRE-SELECTION OF FEEDS AND SPEEDS.
- IMPROVED SPINDLE MOUNTING—with extra-heavy spindle, provides maximum table stability with resulting higher, uniformly maintained accuracy.
- AUTOMATIC LUBRICATION of all moving parts.
- MACHINE ADAPTED FOR OPTIONAL ADDITION OF: Automatic feed stops... Automatic cycling... Automatic tracing control of heads... Power indexing of turrets.

AMERICAN STEEL FOUNDRIES, KING MACHINE TOOL DIVISION
1150 TENNESSEE AVENUE, CINCINNATI 29, OHIO

TG Vertical Boring and Turning Machines

Wherever industry needs heat...

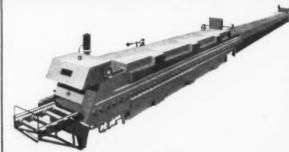
You'll find LINDBERG equipment just right for the specific job



Ceramic Kilns: Gas-fired perlodic kiln (shown) with temperature range to 3250° F.



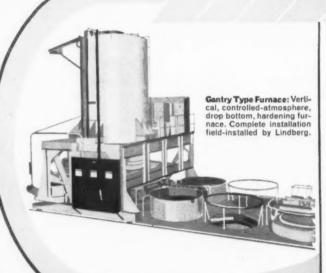
Vertical Type Furnaces: Carburizing and hardening furnace (shown) with CORRTHERM electrical heating elements.



Roller Hearth Furnaces: Continuous electric type (shown) with temperature range 1300° to 2100° F.



Laboratory Equipment: Oneunit box furnace (shown), muffle or for non-oxidizing atmosphere with temperature range to 3000° F.



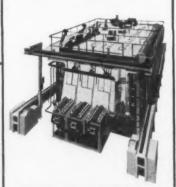
Aluminum Reverberatory Furnaces: Twin-chamber melting and holding furnace (shown) with 45,000 lbs. capacity.



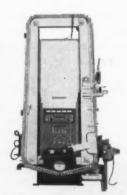
Melting and Holding Furnaces: Electric resistance furnace (shown) with capacities of 750 lbs. to 1500 lbs.



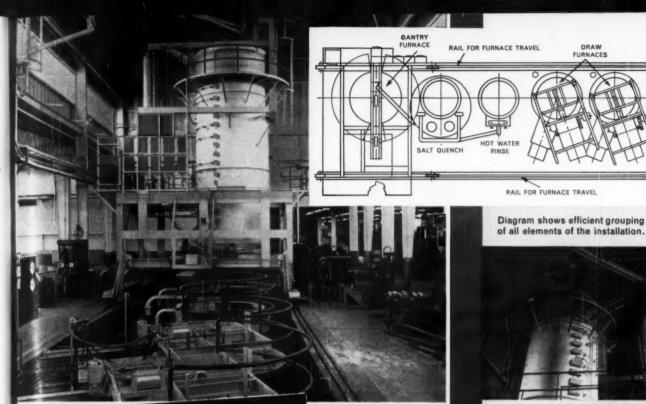
Rotary Hearth Furnaces: Doughnut type field-installed gas-fired furnace (shown) with capacity of 13,000 lbs. per hour.



Multiple Row Pusher Furnaces: Three-row, vertical radiant tube pusher carburizing furnace (Shown). Capacity, 650 lbs. per hour to case depth of 0.055".



High Frequency Units: Vertically designed, completely automatic "HF" unit (Shown) for aluminizing automotive valves.



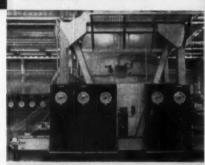
Lindberg-Designed

Furnace is more than 24 feet high. Chain shown at right lifts work into furnace.

The World's Largest Vertical Controlled-Atmosphere Drop Bottom Hardening Furnace

This remarkable furnace combination was recently installed by Lindberg Industrial Corporation for a prominent missile manufacturer. It was designed by Lindberg engineers, in cooperation with the engineering staff of the manufacturer. The furnace is more than 24 feet high and is capable of heat treating rocket cases more than 5 feet in diameter and 20 feet long. The installation consists of the electric, controlled-atmosphere, Gantry type furnace and two draw furnaces, a hot water wash tank, a salt bath quench and a high nitrogen generator. The Gantry type furnace moves under power over the entire installation to load or unload at any of the pit stations. With this installation, production has been economized and speeded, and the metallurgical qualities of rocket cases improved.

Lindberg equipment and Lindberg planning can help you find the most effective answer to any problem of applying heat to industry. We cover the field, heat treating, melting and holding, tempering, brazing, enameling furnaces, ceramic kilns, high frequency units, and are in the ideal position to recommend just the type of equipment most suitable for your needs. This can be factory built or field-installed in your own plant, fuel-fired or electric. Consult your local Lindberg Field Representative (see the classified phone book) or get in touch with us direct. Lindberg Industrial Corporation, 2321 West Hubbard Street, Chicago 12, Illinois. Los Angeles Plant: 11937 South Regentview Avenue, at Downey, California.



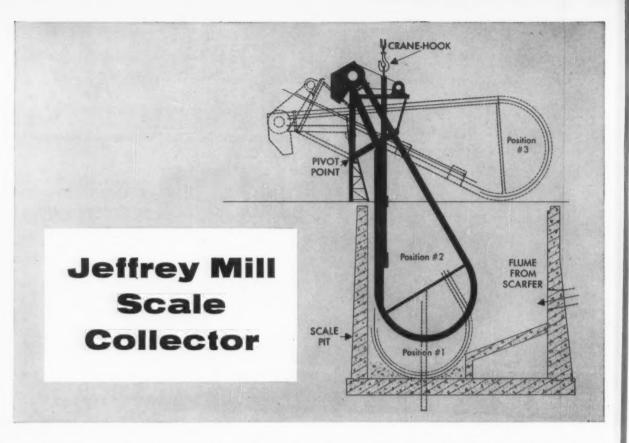
Lindberg control panels are conveniently located adjacent to the installation.



Pit has depth of more than 20 feet to accommodate large rocket cases.



RG heat for industry



- Reclaims scale for recharging blast furnaces
- Prevents shutdown of mill because of accumulated mill scale

The Jeffrey Mill Scale Collector is a selfcontained unit. Chain-driven perforated buckets with manganese steel teeth dig out and convey scale from flume pit for ultimate delivery to ore pile.

It is completely portable. Can be easily removed from scale pit with a mill crane when there is need for repair or clearing jamming. Pivot point makes it possible to swivel conveyor up and out.

There is no shutdown of roll line when conveyor is hauled up for repair in #3 position. When lowered to position #2 on top of accumulated scale heap in the tank, it easily digs itself back to original position #1 at bottom of basin.

Flume from the Linde Scarfer continually

discharges scale into the pit. The Jeffrey Mill Scale Collector with its digger-lipped buckets trenches out the scarfed scale from the flume water for discharge to the ore pile. Salvaged scale is recharged for use in the blast furnace.

Since the installation of the Jeffrey equipment at a steel plant in Ohio, there are no shutdowns. Processing hot roll coil and scarfing billets is now an efficient operation.

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Whatever your water treatment problem—stream pollution—harmful abrasives, recovery of valuable solids or conservation of water supply—Jeffrey will match your exact requirements. Our sanitation engineers design complete systems or individual units...long-lasting, trouble-free equipment for any type of water, sewage or industrial waste treatment. The Jeffrey Manufacturing Company, 1925 North Fourth Street, Columbus 16, Ohio.





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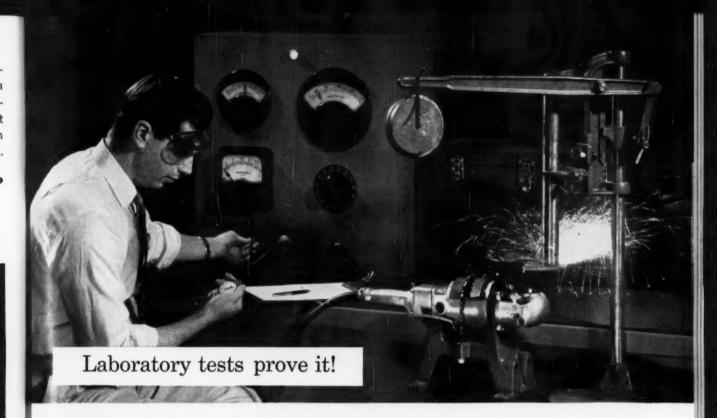
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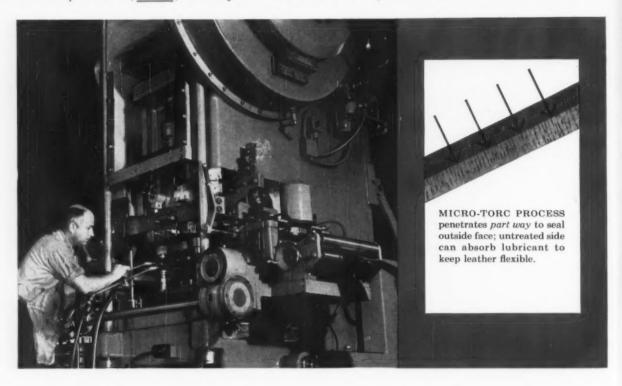
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DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. . DETROIT 13, MICHIGAN



- REINFORCED PLASTIC BOATS are going over big. Of 100 boats shown in a recent San Francisco show, 99 were of reinforced plastics.

 The material also is being used more in autos, trucks, and aircraft. Plastic furniture market promises to grow this year.
- HOMEBUILDING STARTS this year could be a lot better than the year-end forecasts. Congress is expected to pass a multi-billion dollar housing aid bill in the next few weeks. And the shot-in-the-arm could boost housing starts by 100,000 units over the forecast 1.2 million.
- U. S. ECONOMIC GROWTH will soon recover the 3 pct yearly average of past years, say government experts. Yearly growth in output of goods and services has averaged only a bit more than 1 pct over the last five years. But rising population and technical advances are expected to perk up this rate.
- ALUMINUM MILLS are nearing a crossroads in equipment spending. They must decide whether to think in terms of pounds or tons for their next wave of expansion. If it's tons, look for aluminum to begin installing heavy, fast, continuous cold rolling mills.
- BOOMING STEEL DEMAND is only partly due to hedging against a possible steel strike. Evidence is growing that a good share of current demand is caused by better business conditions. Mills say this is pointed up by orders for delivery at specific times.
- HOME IMPROVEMENT INDUSTRY has become a major market for aluminum building products, says Reynolds Metals Co. The company estimates some 300 million pounds of aluminum went into home improvements last year, a 40 million pound rise over 1957.
- HEAVY PRESS DELIVERY SCHEDULES could be on the increase. Builders report backlogs are relatively short at the moment. But delivery of some presses has stretched out as much as 60 days during the last month.
- MACHINE TOOL BUILDERS may be in for better times. One builder reports taking in more orders for one model in January than it had in all of 1958.
- INSTALMENT CREDIT is on the rise. During December, it took its biggest monthly rise in over two years. Auto loans alone rose \$158 million for the biggest monthly boost since February 1956. At the end of the year, instalment credit stood at \$33.8 billion, compared with \$34.0 billion the previous year.

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THE turbine wheel that powers many of our missiles has to be made from a very special kind of steel. A steel that can spin at fantastic speeds—in an inferno of red hot gasses—without flying apart like putty.

Finding just the right steel was a tough problem. But the kind of problem Timken Company metallurgists have been solving for 28 years. And very similar to one they'd solved during World War II.

One of the hurdles in designing America's first jet engine was to find a steel for the turbine wheel that would take the tremendous heat and stress. And that problem was solved when Timken Company metallurgists developed a new kind of "super alloy" steel—16-25-6. Now the question was: Would the steel

that got jets off the ground do the job for missiles?

Missile makers tried it—and it worked! Now one of the big problems in missiles is solved—with the help of Timken® steel.

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TIME STEEL

The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". MAKERS OF TAPERED ROLLER BEARINGS, FINE ALLOY STEELS AND REMOVABLE ROCK BITS

Labor Turnover: It Costs More Than You Can Afford

The high cost of labor turnover is one of industry's blind spots.

An expert tells how to approach this weak link in personnel policy.—By G. G. Carr.

• What you don't know about labor turnover can hurt you badly in the pocketbook. This warning comes from Prof. Frederick J. Gaudet, director, Laboratory of Psychological Studies, Stevens Institute of Technology, Hoboken, N. J., and a top authority on turnover.

Says Prof. Gaudet flatly: "Turnover and the high cost connected with it remain one of management's blind spots. Few executives have any inkling how costly turnover really is. Fewer still have paused to consider all the factors that must be taken into account in calculating a company's turnover expenditures."

Mostly Guesswork — Executives tend to grossly underestimate turnover costs, he adds. Reports to American Management Assn. by comptrollers of nine large corporations gave costs of from \$40 to \$10,000 for the same labor category. In Dr. Gaudet's opinion, the high figures were the accurate ones, the low costs uninformed guesses.

Turnover rates and costs do necessarily vary widely—but they are almost always high. AMA a few years ago found the average cost of replacing a salesman to be \$6684. And nearly one-fourth of the firms answering the survey put the figure at \$10,000 or more.

Then the Intangibles - Replace-

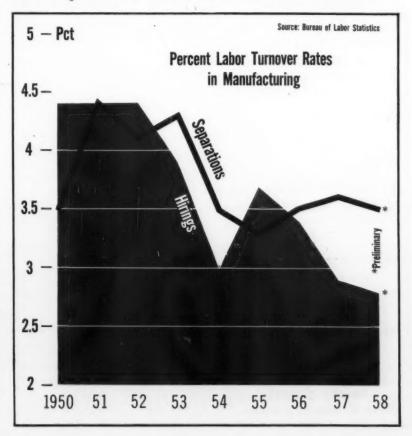
ment cost of an aircraft assembly worker has been put at \$1000, while an insurance company calculated the replacement cost of a dictating machine operator at \$700. In one year, an aircraft maker hired 193 engineers and scientists and lost 139—a net gain of 54. Recruiting cost alone worked out to \$907,000.

And dollar costs by no means tell the whole story. Turnover can and usually does bring loss of morale, reputation, and loyalty, can also lose valued customers. In the long run, the intangible costs may be the highest of all.

Two Basic Causes—There is no magic formula to solve turnover problems, warns Dr. Gaudet.

There are innumerable possible causes, although all fall into one of two basic categories: Poor personnel practices or poor company policy. Since most turnover comes within the first nine months a new

Compare Your Turnover Rate



worker is on the job, selection and indoctrination are critical areas to watch. But weak links in both personnel and overall company policy are not easy to ferret out.

Your Strategy—Perhaps the best single approach to cutting turn-over, suggests Dr. Gaudet, is statistical analysis. First, determine the turnover rate per plant relative to its industry. Comparative figures are available on an industry basis from the government's Monthly Labor Review, and regional figures from state publications of United States Employment Service.

Turnover rates for both plant and departments can be calculated by

Memo to Middle Management:

Don't be too surprised if top brass at first rejects carefully calculated figures on labor turnover cost. Few companies, says Dr. Gaudet, have any accurate idea of the cost of labor turnover. An extreme example was the company which refused to believe that turnover was costing more than \$1 million annually. Reason given for disbelief: The plant didn't make a million dollars a year in profits.

the formula

$$LT = \frac{(R-US)}{N} \times 100,$$

where LT is labor turnover rate, N is average payroll for given period, R is number of replacement employees, and US is number of unavoidable separations. Key word is of course "unavoidable."

Be Systematic — Calculating turnover by departments and/or occupation will often yield a major clue to trouble sources. For further investigation, Dr. Gaudet urges figuring turnover cost. "Sometimes, the greatest overall savings can be made in departments that are generally ignored in computing turnover costs because wage rates are low," he explains.

There are five basic categories to consider in figuring turnover costs: Recruitment, selection and hiring, indoctrination and job training, on-the-job costs, and separation. A sixth category, intangibles, in incalculable, but can be the most costly. Poor cost accounting procedures often result in unrealistically low figures, Dr. Gaudet adds.

A Warning Flag—As a final refinement, check turnover against seniority. High turnover among employees with significant service should be a major warning signal, as well as a whopping cost. But regardless of seniority, those areas which contribute most to turnover cost are the obvious ones to check first for correction.

Importance of turnover costs will grow with automation, predicts Dr. Gaudet. He believes that the worker's continued presence will become more important than his individual skills as manufacture becomes increasingly automatic. But even now, turnover remains a major and unrealized area for cost cutting.

The High Cost of Hiring

Typical costs in representative companies.

Psychological Testing

Sales Manager	\$1600
Superintendent	400
Foreman	240

Medical Examinations

Engineer	150
Packer	8
Laborer	7

Interviewing

Sales Engineer	125
Packer	45
Laborer	10

Screening Applications

Plant personnel manager	84
Engineer	52
Technician	18

Checking References

Foreman			3!
Personnel	specialist	0	19
Packer			19

Miscellaneous

Security and credit checks	\$15-\$200
"Putting on books"	5— 40
Company badge	3— 35
Safety glasses	3

Source: Dr. Frederick J. Gaudet

Building Spurs Equipment Sales

Suppliers Expect Strong First Half, Good Year

News of a sharp increase in heavy construction contract awards was welcomed by equipment makers.

They believe their 1959 sales may hit \$2 billion, near the all-time record of \$2.4 billion.—By K. W. Bennett.

• Most construction equipment makers are counting on a 12-17 pct gain in sales this year.

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One executive even says, "I'm betting we'll have the biggest year in our company's history." Generally builders of earthmoving equipment are not quite that optimistic.

But, they point out, if sales hit \$2 billion in '59 the industry will have its best year since the record shattering \$2.4 billion sales of '56. (See chart.)

Cause for Joy—Heavy construction contract awards jumped 22 pct in December, looked even stronger in January. And since equipment orders move up with heavy contract awards, the sales chiefs regard this as a hint of more good things to come.

Comments like these were made in Chicago at the 40th Annual Meeting of Equipment Distributors: "January is running ahead of December by 20 pct, in orders booked." The speaker directs sales for a manufacturer of light and heavy construction equipment. International - Harvester Vice President, Harold T. Reishus, noted "Our domestic order backlog is at the best level since Korea."

The View Ahead—A wave of price increases in the fourth quarter averaging 4 pct failed to discourage the rising level of purchases. Most equipment builders now predict:

A heavy level of first-half buying

as contractors move to beat another round of price increases expected after June.

A high manufacturing level by equipment builders during the first half, as they race to beat a possible steel strike. Most have ample raw steel inventories, but are taking no chances.

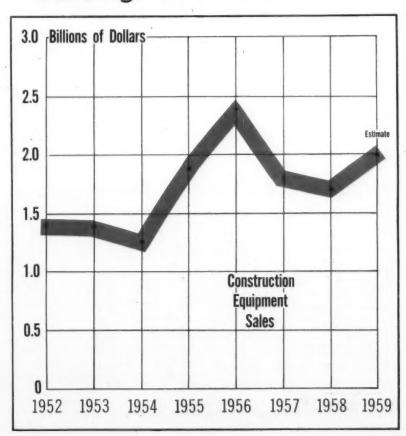
An improvement in export sales, though a strong percentage of this equipment will be manufactured at new plants located in foreign market areas the builders are developing.

Increasingly tight credit, which will make dealer financing more difficult in second half 1959.

A new record in total U. S. construction outlays of \$52 billion, with highway expenditures alone rising 15 pct.

Plateau Coming? — Over the 1949-1959 decade, earthmoving equipment dollar volume averaged an annual gain of nearly 30 pct. Yet the average annual gain in the past four years has been only 2 pct. There are current estimates the next decade will see a 6-10 pct average annual growth in dollar volume. One company officer, less optimistic, sees a plateau reached as early as 1965.

Building Tools: Near Record?



Gangway for Reinforced Plastics

Industry Sales Gain in Virtually Every Market

Reinforced plastics sales were up 10 pct in '58 despite the recession.

Still further gains are looked for this year. Auto and boat uses gain.—By W. Czygan.

• Metalworking can expect reinforced plastics to penetrate still deeper into some of its traditional markets. So says the Reinforced Plastics Div., Society of The Plastics Industry, Inc., in marking last year's gains and forecasting expected 1959 output.

At the same time, the group cites wider use of structural plastics by metalworkers themselves.

In a report to members attending its 14th Annual Exhibit and Conference in Chicago last week, the division said 1958 sales totaled 185 million lb. This is a recession-smashing increase of 10 pct over the 168 million lb recorded in 1957.

Still Going Up—A strong surge in January sales is already forcing upward revision of expected gains in 1959. Some industry leaders now predict this year's increase will run between 20 and 25 pct, raising 1959 volume to 225 million lb.

Sales are growing in virtually every major market for reinforced plastics. A sharp increase in popularity of glass-reinforced plastic boats was borne out by recent boat shows across the country. Of 100 boats exhibited in San Francisco, 99 were fiber glass. Plastics also accounted for 166 of the 481 boats shown in New York. If the latter show continues to be an accurate barometer as in years past, production of polyester-glass boats in 1959 should be around 100,000 units.

All-Plastic Truck Cab — The transportation field, too, is a fast-growing market. While volume in this area fell off 12 pct during 1958, it only reflects last year's drop in auto sales. There's greater poundage per car in all leading 1959 lines.

Gains are noted in reinforcedplastic car bodies, and in premix compounds for auto components. A new all-plastic truck cab and a growing number of truck and trailer bodies are big factors in this year's expected output.

Commercial airliners will account for part of 1959's sales. Jet-transport builders are using reinforced plastics for luggage containers, flooring, commodes, radomes and other parts. Stepped-up missile production is reflected in greater demand for high-temperature resistant structural plastics.

Influence Spreads — High-pressure filament-wound plastic structures developed to contain jet fuels and gases are finding a civilian market as corrosion-resistant tanks. Demand for reinforced plastic ducts, pipe, and vessels in the oil and chemical industries is well above the expected level. Use in building panels jumped 25 pct, with sales of about 62 million sq ft.

Trays, tote-boxes and other containers, both for industry and home, continue as one of the healthiest markets. Reinforced plastic furniture promises to grow during the coming year; and outboard-motor shrouds should use about half again as much material for a total of 2.5 million lb.

Wider Choice — Polyesters are still the dominant resin, but epoxies are coming up fast, especially in aircraft, missiles, tanks, ducts, pipe, electrical panels, tooling and architecture.

Use of phenolic resins is growing in aircraft, missiles and electrical parts; acrylics, too, will turn up more often this year, mainly in sheeting and paneling.

Fibruous glass continues as the prime reinforcement. Asbestos is moving in where resistance to high temperatures is needed.

Where Reinforced Plastics Go

	1958		1957	
Major Markets	Consumption, millions of lbs	Pct of '58 total	Consumption, millions of lbs	Pct of '57 total
Aircraft and Missiles*	18.5	10	25.2	15
Appliances	7.4	4	5.04	3
Boats	37.0	20	25.2	15
Construction	31.45	17	25.2	15
Consumer Products	24.05	13	25.2	15
Containers, Trays,				
Industrial Housings	7.4	4	5.04	3
Electrical	7.4	4	5.04	3 3 2
Pipe, Tanks, Ducts	5.55	3	3.36	
Transportation**	29.6	16	33.6	20
Miscellaneous	16.65	9	15.12	9
	185	100	168	100

^{*} Volume fell in 1958 but uses increased.

^{**} Reflects drop in auto sales; poundage per car increased.

Why Contract Maintenance Is Growing

Many companies now "buy" their maintenance from outside contractors on a fee basis. This use of contract maintenance can have important cost advantages.

Here are the benefits according to Alan McCone, assistant to the president, Catalytic Construction Co., which supplies professional maintenance services:

<u>Tailored Staff</u>: Size of work force is tailored to changing needs of the plant. Fewer Manhours: Contractor provides workers as required. There's no need to keep excess help around for possible emergencies. Idle time and make-work assignments are eliminated.

Quality Work: Productivity of building trades craftsmen equals or exceeds that of plant's mechanical force on maintenance jobs.

Lower Labor Costs: Total hourly expense for construction workers is below cost of plant workers. Reason: Less fringe benefits and hidden costs are included in wage payments.

Equipment Savings: Regular stock of frequently used tools and equipment is set up. Additional equipment, if needed, is rented from contractor.

Thorough Planning: Contractor, with experienced, full-time office staff, can carefully plan and completely coordinate all maintenance activities.

Look Out for Maintenance Costs

A decade ago, few plant managers were worried about rising maintenance costs.

Now it is realized that industry may be wasting \$4 billion annually.—By T. M. Rohan.

■ Maintenance experts have sounded a warning: Upkeep costs of automatic machinery are climbing so fast that some plants can go out of business if they don't get them under control.

The warning is backed up by statistics. About \$4 billion, or 25 pct of total maintenance costs, is wasted every year by U. S. industry. In heavy metal fabricating, alone, plant maintenance costs are up 17 pct—the highest 'ratio in heavy manufacturing.

Few Saw It Coming—For 687 manufacturing firms on the New York Stock exchange, maintenance and repair costs were about two-thirds of net profits, or \$7.5 billion

These skyrocketing costs, were considered a negligible item 10 years ago, says L. C. Morrow, a New York consultant. As a logical result, outside maintenance companies are springing up and handling all maintenance work for some new oil refineries and chemical plants. And they are eager to replace inefficient company operations (see box).

Lack of Understanding—According to O. W. Graveley, maintenance director of Electro Metallurgical Div., Union Carbide Corp., the 25 pct wasted maintenance costs is due to lack of understanding of maintenance or improper factory methods.

"During the past 10 years, automation, labor and material costs have increased as a part of product cost to a point where the need for controlling maintenance is vital to a manufacturer staying in business," he said.

Labor rates have a lot to do with the expense.

Oil Can Mechanics—"It costs on the order of \$2 to \$4 to apply \$1 worth of lubricant these days," says J. H. Fuller, consultant supervisor at Du Pont Co., Wilmington.

Use of lubricants is on the order of 2 billion gallons annually for factories, transportation, utilities, construction, and agriculture, Mr. Fuller said.

Added Incentive—Outside maintenance contractors in the last two years have taken over total maintenance in several new oil refineries and chemical plants, says P. M. Kimmell, plant engineering supervisor for Eastman Kodak's Hawk-Eye Works, Rochester, N. Y. And there are a number of these contractors prepared to take over an entire factory's maintenance, he said.

"The maintenance force that is not doing its part in keeping its company in the competitive race . . . has the prospect of being replaced by contract maintenance," he warns.

Is Industry Winning Tax Battle?

Heavy capital spending in recent years has built up depreciation allowances.

And tax code changes may finally be paying off in tax relief.

—By G. J. McManus.

• In 1958, for the first time, estimated corporation depreciation charges ran ahead of estimated corporate income taxes. (See chart)

One reason for this was the continuing heavy outlays by U. S. business for new plant and equipment. In the last three years this spending totaled more than \$100 billion. Depreciation charges were bound to grow.

Delayed Action—But there may be more to it than that, say accountants. They say there is some evidence that changes in the tax code have at last brought permanent help to industry in its battle for more realistic depreciation for tax purposes.

Effect of depreciation has been to conserve corporate dollars and to hold down corporation taxes. Since 1952 depreciation charges have more than doubled. In the same period, corporation income taxes have dropped slightly.

Pace Continues—Fast tax writeoffs account for part of the shift in corporate funds. But even with the write-offs peaking out, there is no sign depreciation allowances are dropping. They jumped nearly \$2 billion last year despite the economic slump.

The beginning of these changes came early in the Eisenhower administration with a directive by the Internal Revenue Service. In effect, tax agents were told to go easy on special depreciation claims. The ruling opened the way for the various forms of accelerated deprecia-

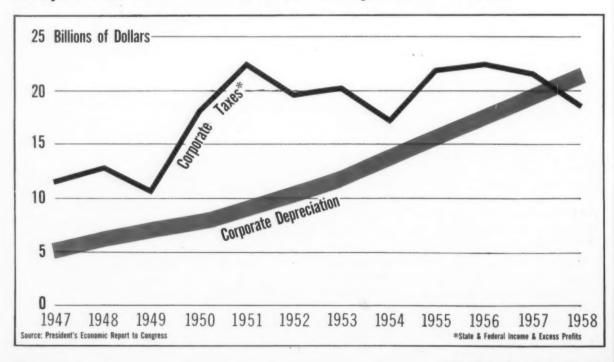
tion. However, companies were reluctant to try the new methods without more specific authorization.

Anti-Inflationary — In 1954 a push spearheaded by chemicals and steel brought general reform of the tax code. The new code spelled out such systems as the sum-of-the-digit years and double-declining-balance.

Basically these systems combat inflation by making dollars available as much as possible while their value still approximates the original investment value. The greatest part of the depreciation charge is made in the early years of the machine's life.

Break for Small Business—Further, the 1958 technical amendments to the revenue code liberalized depreciation for small business. A manufacturing concern with fewer than 250 employees may now depreciate in the first year up to

Depreciation Overtakes Corporate Taxes



20 pct of the first \$10,000 paid for new equipment.

Normal depreciation may be applied on top of this. Under the code definition of small business, a distributor with annual sales volume under \$5 million is eligible for the same provisions.

Room for Improvement — The amended code also allows a small business to file taxes either as a corporation or a partnership.

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As this provision is written, accountants feel it has too many limitations and pitfalls to be useful on a wide scale. One accounting firm is applying the provision in only 2 out of 240 cases.

It's Cash That Counts — More important than these recent amendments is the longterm trend toward greater emphasis on the "cash retained" principle. For the tax accountant, the important thing is no longer the balance statement or the profit-and-loss showing.

More sophisticated companies are now primarily interested in dollars retained, whether they be classed as income, depreciation, or something else.

Favorite Formula—Shortly after the 1954 code was enacted, the revenue service dug up a clause dealing with salvage value. The clause said charges must take into consideration the fact that a machine can still be sold as scrap even after it has been fully depreciated.

Accountants argued that ultimate disposition was seldom profitable but the problem brought a swing away from the digit method of reckoning. The 1954 code gives specific protection to the double declining balance method and this gained favor.

Accountants Battle On — The revenue service has also resisted depreciation claims on the grounds that they were based on too short a machine life. Accountants answer this with the doctrine of obsolescense.

Antitrust Campaign

Steel and Automakers Under Fire

Broad - scale antitrust drive may result from hearings in New York and San Francisco.

Present steel probe checks price-fix charge in structurals. —By N. R. Regeimbal.

 Government trustbusters are preparing a major offensive against big industry.

First step is a broad-scale attack on two basic industries, steel and automaking. It could result in a breakup of U. S. Steel and General Motors into smaller, independent units.

These two are the perennial whipping boys of the trust busters. But this doesn't change the seriousness of the situation, nor does it mean the corporations will have any easier a time.

Bigness Under Fire—The Justice Department is opening grand jury investigations against the steel industry in San Francisco and General Motors in New York.

They will lay the groundwork for a full-scale attack on bigness as shown in "undue concentration" in major industries, and in industrial pricing practices. The action may well spill over into the aluminum, chemical, and other basic material producing segments of the economy.

It is an economic attack on major industry practices long dreamed of by the Justice Department staff. The move may turn into the biggest antitrust drive since the early 1900's.

Price Fixing Charge—At present, the steel probe is limited to an expected grand jury investigation of charges of price-fixing in sales of structural steel on the West Coast. The trustbusters are keeping the details a close secret. But there are indications the effect of this investigation could go well beyond a simple price-fixing case.

Some 25 or 30 companies which sell structural steel to fabricators in the West may be involved, officials indicate.

If the grand jury investigations produce a court case, it could turn into another broad attack on various pricing practices — delivered pricing and industry-wide competitive pricing which has been bitterly criticized in Congress as "administered pricing."

The probers are also likely to save some of their ammo to throw at the steel industry if prices are raised, as predicted, this summer.

GM Splintering?—The GM case could also have a far-reaching impact. Indications are the main purpose is gathering information which can be used eventually for a civiltype action to split the nation's number-one automaker into several smaller units. Some of its production divisions—Pontiac, Buick, or others—could be ordered broken away from the parent. Similarly, GM's financing division, locomotive, appliances, parts, or other branches could be spun away by a court order.

If the Justice Department scents success in the GM test companies such as U. S. Steel could be the next to come under the split-up guns, officials indicate. Such allegedly "unrelated" operations as cement and consumer products have long been under study, and could be a target, Department sources imply.



FREE CHINA STEEL: Steel is now expensive on Formosa because much of it is imported. But new



capacity being built is expected to spur increased demand and start foundries humming.

New Steel Mill in Free China

Demand for steel in Formosa is low because much of it is imported, therefore costly.

But when a new plant is finished the additional metal is likely to spur industrial expansion.—By Don Frifield.*

• Free China's steel output will be at least doubled by 1961, maybe trebled by 1962.

A new integrated iron and steel plant now being built at Kaohsiung, Formosa, will add 150,000 to 200,000 tons of steel to Taiwan's present annual capacity of 100,000 tons.

It Will Spur Demand—Demand for steel on the island now is nowhere near the proposed capacity. But the new plant is likely to stimulate this demand by 50 or even 100 pct. Heavy tonnages of some steel products must now be imported, and therefore are expensive.

New steel, in excess of domestic demand, will be sold in Korea and the Southeast Asian countries of Viet Nam, Philippines, Indonesia, Malaya, Singapore, Thailand and Burma.

The new steel plant will produce rails; structurals; bars — round, square, hexagonal, flat, and sheet; and billets.

Market Outlook — An educated guess at Taiwan's 1960 use of steel products from the new plant is 10,000 tons of rails, 10,000 tons of structurals, 2500 tons of round, square and hexagonal bars, 2500 tons of flat bars, 25,000 tons of sheet bars, and 25,000 tons of billets.

In 1960 about 10,000 tons of rails are likely to be exported, mostly to Korea, Hongkong and the Philippines, where demand is just small enough to justify the assumption they will not be producing their own rails.

About 10,000 tons of structurals, and 5000 tons of round, square,

and hexagonal bars are also on the export agenda, rounding off planned steel shipments outside the island at 25,000 tons.

Other steel products are expected to be too much in domestic demand to permit exports of any quantities.

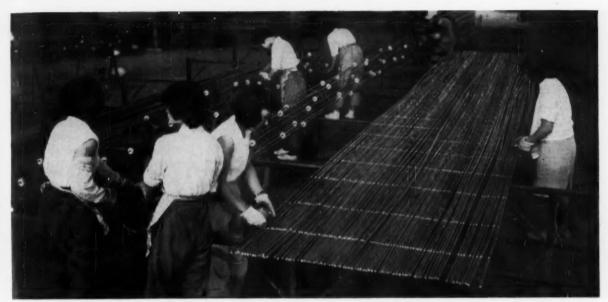
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What It Will Cost—The new steel plant, still unnamed, will cost \$5,065,000, according to J. G. White Co., New York, consulting engineers on the project. Part of this will be American aid funds.

There will be adequate power for smelting iron ore from the current hydro and thermal systems on the island. But this is likely to be a problem in the future. Industry is expected to expand too rapidly with the new steel available, for power facilities to keep pace.

Taiwan's own iron ore deposits are small and generally low grade. Only one plant, the Taiwan Iron Manufacturing Co., makes pig iron. Its capacity is about 50 tons per day for foundries, and for duplex



FOR CONSTRUCTION: Women workers at the island's largest steel concern, Tang Eng Iron Works,

make a reinforcing structure for concrete telephone poles with rod produced in the same plant.

steel production in a three-ton sideblown Bessemer converter and a small electric furnace.

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Ore Is Imported—Mostly, the steel industry imports high grade ore, from Malaya, or uses scrap with the proficient techniques learned from the Japanese.

The island does have good supplies of coking materials, large deposits of limestone and good quality dolomite. Coal reserves are estimated at 140 million metric tons, of which about 56 million metric tons are coking coal.

Present Capacity — Taiwan's present steel industry consists of about 45 plants. A dozen, all of small capacity, produce only ingots or castings. The Tang Eng Iron Works, Kaohsiung province, produces about 60,000 of the current 100,000 ton steel capacity of the island.

The Taiwan Steel Rolling Mill rolls 12,000 to 15,000 tons per year of bars, light structurals, and rails.

*Mr. Frifield visited Formosa to study the condition of the island's industry and economy.



NUMBER PLEASE: Much of the sheet steel produced on Formosa is fabricated locally into finished products, like these telephone booths.

A Better Buy in Baltimore

No Place Like Home - Pittsburgh-Des Moines Steel Co. reversed the overseas trend in industry and moved its plate fabricating plant to the U.S. from Cadiz. Spain. It is now in Baltimore.

The plant will fabricate steel for bridges, storage tanks and others. It will serve the East Coast, but is primarily intended for export

Why in view of recent statements from U. S. industry on the favorable cost situation abroad, does a domestic concern not only choose an American site but actually pick up a plant and move it here from Europe?

Number one reason, says Pittsburgh-Des Moines was that it is cheaper to fabricate plates in this country. In its work-oil tanks,

flat bottom tanks etc-a large part of the cost is raw steel. Labor costs are relatively small.

Bigger We're Better-The company reports American steel is the cheapest in the world for heavy flat rolled shapes. When it was operating in Spain, Pittsburgh-Des Moines checked Italian, German and other European steel sources. In many cases their bases prices on plates were under American prices. But European extras were much

When they were figured, it was cheaper to haul plate from America than to buy from mills on the con-

Other reasons for the move: The difficulties of doing business in Spain, and heavy taxes.

Why Does Russia Want U. S. Pipe?

Russian industrial leaders are still trying hard to buy large-diameter line pipe in the U.S. But the government is blocking this attempt on the ground that the pipe would add to the Reds' war potential.

The Reds want to buy approximately 13,000 tons of 28-30 in. line pipe, worth about \$2.5 million. Export of this diameter is forbidden to Communist countries for military reasons, so the U.S. Commerce Dept. denied an export li-

In There Pitching-Just recently, a new application was submitted to the same licensing authorities, for the same tonnage of the same pipe. The re-application was accompanied by a plea for special consideration. So it has been referred to the top man in the U.S. Commerce Dept.—Secretary Lewis L. Strauss. There the matter now rests.

The Commerce Dept. declines, as a matter of policy, to name the parties applying for export licenses.

The First Team - The recent visit of Anastas Mikoyan, top U.S.S.R. trade expert, to the U.S. created widespread conjectures among U.S. industrial management on chances for increased trade between the U. S. and U.S.S.R. But existing U. S. laws forbid the shipment to Soviet-bloc countries of any items related to the waging of war or the support of defense industries. This eliminates some products, as large line pipe.

Steel Shipments Off

Shipments of finished steel from the mills in 1958 totaled 59,914,-433 tons, reports the American Iron and Steel Institute. This was down sharply from the 79.9 million tons shipped in 1957.

Shipments of electrolytic tin plate, and galvanized sheets both bucked the trend last year and topped the year before. The 5,040,-190 tons of tin plate shipped was a new record. Total for galvanized sheets was 2,828,848.

Merger Talks End

In a joint announcement. Pittsburgh Steel Co. and Sharon Steel Corp. have called off merger negotiations (See The IRON AGE, Feb. 5, p. 41.)

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The companies say it does not appear "a satisfactory basis for merger could be reached."

Strategic-Udy Process

A group of Canadian companies has authorized Koppers Co., Pittsburgh, to make a study of the feasibility of building a plant for the direct reduction of iron ore by the Strategic-Udv Process.

The report, from the Koppers Co., did not name the companies.

The Strategic-Udy process for making steel directly from ore, bypassing blast furnaces, was developed for Strategic Materials Corp. by Dr. Marvin Udy.

The Udy process was described in The IRON AGE, Oct. 9, 1958, p. 81.

More Bethlehem Steel

Bethlehem Steel Co. is willing to spend "several hundred million dollars" to add 1.56 million tons of capacity to its Lackawanna, N. Y., plant.

Vice president in charge of operations, Edmund F. Martin, said the steel making facilities would be added as the needs of the area dictate.

West Coast H-Iron

Plans for building the first pilot H-iron plant on the West Coast, have been filed with the Air Pollution Control District of Los Angeles County, by the Los Angeles plant of Bethlehem Pacific Coast Steel Corp. The project reportedly, will cost close to \$2.5 million.

Deflection .0013" Per Foot-Parallelism .00025" Per Foot Over 40 Feet in this Giant 4000-Ton Press Produced by DANLY for

. O. Smith Corporation

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de members for truck frames are stamped out in sizes to 40 feet in length for the heaviest duty trucks in this 300-ton Danly press at the Milwaukee Plant of the O. Smith Corporation. The press slide comes down are and a heavy-gauge steel "sidebar" is ready for sembly. The press operating rate is 10 strokes per inute.

The bed deflection .0013" per foot—measured and tested A. O. Smith engineers—required a bed so massive at it had to be made in two halves along the right to tenter line, to stay within transportation limits. The lives are tie-rodded and keyed together.

The cushions, placed in the bed opening, are so conructed that they will absorb any extremes of off-center

The bed surface and slide each machined at one setg—checked out flat and parallel within .009" over the ft. length representing a parallelism bed to slide 0025" per foot.

The Danly Microinching Drive will move the slide rough an entire cycle at slow speed for die setting d produce an accurate part without stopping the flyneel and deliver full-rated capacity of the press.

The extremes of weight, size and accuracy of weldedel fabrication and machining represented in this press are achieved by the combination of heavy handling ruipment including 100-ton Whiting Cranes and the 7" ddings & Lewis Horizontal Bars mounted on 100 ft. hways in Danly's new facilities.

The press is now operating. It is reflecting the acracy of manufacture to its great size by stamping curate parts in daily production.

This press was designed specifically for, and in coeration with, A. O. Smith Corporation, pioneers in cient production and leading supplier to the autotive industry... by Danly, the leading supplier of mping equipment to the automotive industry.

This press typifies Danly's ability to work with you to sign, engineer, and produce new presses for new plications to increase capacity, lower stamping costs, gthen die life, and reduce downtime. Find out how.

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Autofeed Presses • Double-Action Straight Side Presses
Underdrive Presses • Quick Die Change Presses
...as well as accessories and controls



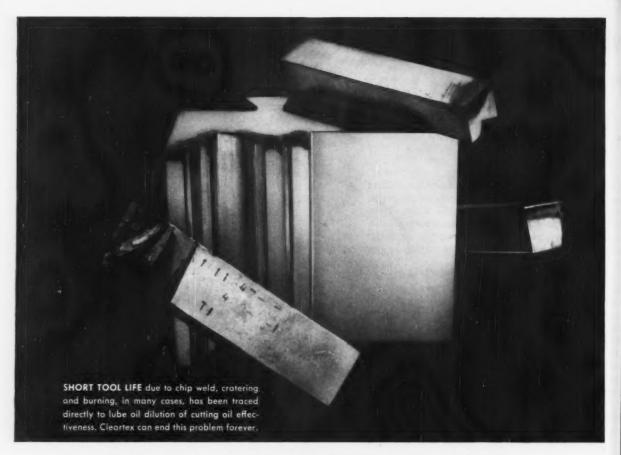
DANLY 4000 TON STRAIGHT SIDE PRESS

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It happens in 7 out of 10 automatics!

Diluted cutting oil shortens tool life drastically

Lubricating oil is probably leaking into the cutting oil sumps of your automatic screw machines as you read this. Current research proves that this is happening in 70% of all the automatics in use today! And where it happens, it shortens tool life by as much as 50%—even 70%. On top of this, the cost of extra regrinds, lost production during tool changes, and excessive scrap production is putting a premium on screw machine operation in too many shops.

Look for these symptoms. One sure sign of dilution is the need for frequent refilling of the lube oil sump. If you are using an ordinary lube oil, this dilution will create two additional—and more costly—symptoms: excessive scrap production and frequent regrinds. Now you can eliminate these forever with the

TEXACO CLEARTEX CURE

The exceptional chemical stability and load-carrying ability of Texaco's Cleartex series make them equally suitable for use as cutting oils, lubricants or hydraulic fluids. All you have to do is use them for both cutting and lubrication. With Cleartex in all your sumps, you'll find cutting oil dilution will stop and screw machine production cost will drop substantially.

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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Joel Hunter

How to Move Ahead in a Slump

Crucible, a major producer of specialty steels, emerged from the recession in good shape.

Here's how president Joel Hunter and his management team did it.

• Any way you look at it, Crucible Steel Co. of America should have been hit hard by the recession. But it wasn't. To the folk at Crucible, the recession of 1957-58 was something that happened to the other fellow.

When the business cycle peaked and began turning downward in the third quarter of 1957, this company was braced for it. And the reason it was ready was because recession-conscious, ex-accountant Joel Hunter was at the helm.

More Assets, Fewer Debts — Earnings sagged into the red briefly in the third quarter before Mr. Hunter got things under control. Then the unbelievable happened. While the business slump continued its nosedive, Crucible climbed back into the profit column in fourth quarter '57.

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In each quarter of 1958, Crucible paid dividends out of earnings. The company came out of the recession with the most favorable debt-to-asset ratio in 10 years.

Warning Signs Heeded—None of this happened by accident. It followed a plan of action laid out well in advance by Mr. Hunter and his alert staff.

"Our people knew what was coming," explains Mr. Hunter, "and they knew what to do about it."

Georgia-born Joel Hunter came to Crucible in 1951 after account-



JOEL HUNTER: Management quality is most important.

ing experience as a partner in the firm of Haskins & Sells. He moved up to the presidency just as the slump of 1954 began. While it was a moderate recession, it was enough to show the need for cushioning extreme swings in specialty steel sales.

Area for Gain — Mr. Hunter analyzed the 1954 sales statistics and learned that warehouse sales of specialty steels fell off only about half as much as mill sales. So in 1955, Crucible started a program to triple its warehouse space.

In 1958, the company's warehouse sales were off only a fracMoney, Materials, and Men — There were other important moves made by Mr. Hunter. Right down his alley was an overhauling of the company's financial structure. He converted all preferred stock to common stock.

He expanded the company's research program. Spending in this area hit a new high in 1958.

But more important to Crucible than any specific techniques or programs, Mr. Hunter feels, is the quality of its management. He has been working in this direction for some time. He credits his company's recent good showing to the ability of management all down the line.

Quantity PRODUCTION of GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
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ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

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Is Budget Optimism Justified?

To meet lke's balanced budget needs, business will have to improve rate of recovery.

A comeback of 1955 proportions is needed to meet White House revenue hopes.

• The Administration set some high goals for business in its Economic Report for 1959.

It indicates that Ike's economic advisors have higher hopes for the year than most businessmen. The revenues called for in the proposed balanced budget depend on a greater rate of recovery than is looked for by industry.

Just Like 1955—The report puts expected government revenues at a record \$77.1 billion. This means a rate of recovery in 1959 similar to

that of 1955. Most businessmen expect a steady recovery, but more gradual than the sharp upward jump from the 1954 recession.

It's estimated that \$77.1 billion in Government revenues will require a Gross National Product of about \$470 billion. This compares with the 1958 GNP of \$437 billion.

Big Jump Needed—For a more current comparison, the fourth quarter 1958 GNP rate was \$453 billion. This gives you a good basis for judging the rate of business that will be needed to meet the Administration's goals.

It also means a gain of \$33 billion, just a little less than the \$34 billion climb of 1955.

Another indicator: Personal income is expected to jump about \$20 billion this year to \$374 billion. If

attained, it will also be close to the rate of improvement in the 1954-55 recovery.

How Much? — The question, then, is whether these estimates are too high. Administration advisors were slightly on the optimistic side in gaging the end of the recession and the rate of recovery in 1958, but only slightly so. You will recall that Ike's former assistant Gabriel Hauge was chided for over-optimism, but events proved he was on the right track.

As it stands now, the estimates look to be on the high side, although not out of reach. But it will take a big improvement in capital spending, a continued gain in automotive production over last year, and no disruption of the economy by a steel strike to reach them.

Consumers and Manufacturers Step Up Buying

Put together some of the latest indicators and you get a good idea of the strength of the recovery. Here are a few:

Instalment credit in December took the biggest monthly jump in over two years. Consumers took on new interest in durable goods, particularly autos, and showed no hesitation to go on the books for them.

Long Time Between Cars—Reflecting good sales of new models, auto paper rose \$158 million, adjusted, during the month. It was the largest monthly increase in auto loans since February, 1956.

For all instalment credit, December extensions were the biggest monthly jump since November, 1956.

At the end of the year, total in-

stalment credit stood at \$33,865 million, compared with \$34,095 million the previous year. Auto paper, at \$14,006 million, was well below the year-ago figure of \$15,-400 million.

Sales and Orders—At the same time, sales and orders of manufacturers continued to climb, but not spectacularly.

The month-by-month gains toward the end of the year brought sales and orders well above the rate of a year ago. Sales, at \$28 billion were back at the level of October, 1957.

New orders, at \$28.1 billion, are equal to May, 1957, when the decline was about to get under way.

However, durable goods industries orders have not picked up since October. It's too early to say whether that means a leveling, although the hot steel market today should mean a sharp pickup.

Employment Outlook

A Dept. of Labor employment survey gives some assurance that the job outlook will improve through the first quarter. However, the looked-for pickup is only modest and unemployment in major industrial areas looks like a nagging problem.

Employers in most sections of the country expect to do more hiring through March. Steel and machinery centers are expected to show the best employment improvement. Auto and aircraft employment is expected to be steady.

L-D PROCESS BASIC OXYGEN PROCESS OXYGEN STEELMAKING

Which is which—How do they differ?

L-D PROCESS in action

In the rapidly broadening use of oxygen in steelmaking, various names have been applied to differing, and even the same, oxygen steel processes.

To clarify terminology, the American Iron and Steel Institute has assigned the description BASIC OXYGEN PROCESS as the generic term for any basic steelmaking process wherein oxygen gas above atmospheric concentration is a dominant factor. The American Iron and Steel Institute definition is "The term 'basic oxygen steel' is used to define a steel which is considered to be the equivalent of basic open-hearth steel, and whose residual nitrogen content is not in excess of 0.007 per cent."

Specification writing societies including the American Society for Testing Materials and the American Petroleum Institute have applied the same terminology. The American Bureau of Shipping has also used the same general terminology with certain added qualifications.

L-D Process Explained

The L-D PROCESS, for which Kaiser Engineers is the exclusive U.S. licensor, is one of these BASIC OXYGEN PROCESSES and the one in widest use today. Of approximately 70 furnaces operating or building within this classification, 62 are the L-D PROCESS type.

(The remaining 8 are rotating vessel processes which should not be confused with the L-D PROCESS.)

L-D PROCESS is the generally accepted designation of the process where molten pig iron and scrap is subjected to high purity oxygen blown vertically onto its surface in an upright furnace.



Charging molten iron



Charging scrap



Blowing



Tapping

L-D Process Advantages

Reasons for world-wide preference of the L-D PROCESS include faster production, better product quality, adaptability to a variety of hot metal analyses, and the low capital investment of about \$13 to \$15 per annual ingot ton vs. \$18 for electric furnaces and \$33 for open-hearths.

The L-D PROCESS has also been termed "Linz-Donau" (Linz on the Danube), "Linz-Donawitz," location of the two originating steel plants in Austria and "Linzer Dusenverfahren" which has been interpreted as "Linz Jet Process." Actually, no special significance is attached today in the U. S. to the letters "L-D" other than the fact that they specifically identify, in every part of the world, the generally preferred process for adding new steel-making facilities.

Complete Steel Plant by KE

1

Kaiser Engineers designs and builds complete L-D PROCESS installations; also designs and builds complete steel plants including blast furnaces, openhearth and electric furnace installations, sinter plants, rolling mills, pipe mills, by-products plants, ore beneficiation, air pollution control and water treatment facilities.

For complete new-plant or expansion service, from process design to start-up day, KE offers experience coupled with traditional Kaiser ingenuity. The L-D PROCESS is an example of KE's capability in the application of new developments to the steel industry.

For full information on L-D PROC-ESS or other KE services in steel plant design and construction, call or write KE at:

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Has Glass Use Hit Its Limit?

Or Will New Cars Use Even More in Years to Come?

Glass area in automobiles has increased as much as 66 pct in the past 30 years.

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Now designers are considering its value as a structural material.—By H. R. Neal.

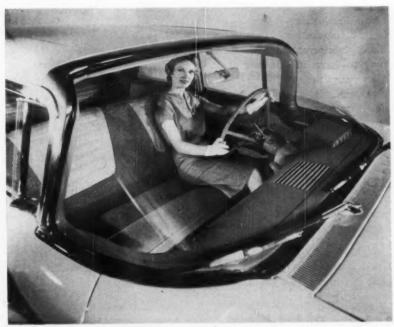
While cleaning the large expanse of windshield on a 1959 model car recently, a service station attendant was heard to grumble: "If these windshields get any larger, we're going to have to join the window washers' union."

Glass usage has grown tremendously in recent years. Nowhere is the greater use of glass more evident than in windshields and backlights (rear windows). They now wrap over and under and around and every which way.

Mercury Has Most—Mercury's windshield, the largest in the industry, accounts for 1883 sq in. of the total glass area of 5042 sq in. found on the car (see photo, right). Ten years ago the windshield area was only 728 sq in. And Mercury's not alone in this.

Since 1930 Chevrolet's windshield has more than tripled in area—from 550 sq in. to 1810 sq in. Total glass area has increased 66 pct over the same period, despite today's lower cars, from 2630 sq in. to 5040 sq in. found in present models. As recently as 1950 glass area in this make was only 3045 sq in. Cadillac has 54 pct more glass than in 1930—5205 sq in., compared with 3393 sq in.

Where's the End? — These increases, then, would seem to indicate it won't be long before we'll be driving solariums on wheels. Au-



BIGGEST WINDSHIELD: The 1959 Mercury's big compound-curved windshield, largest in the industry, has 60 pct more glass area than 1958 models. It accounts for 1883 sq in. of a total glass area of 5042 sq in.

tomakers have already reached this state in their "idea" cars. Many of these styling showcases feature upper bodies made almost entirely of transparent materials. General Motors' Firebirds I, II, and III are good examples.

According to Dean Bedford, staff engineer at GM's Styling Staff, there are a number of reasons why more glass is desirable in the upper structure of cars. Vision, of course, is the prime reason. But freedom of design is another. However, the transparent top presents a number of problems.

Will Plastics Take Over?—So far, most of the see-through tops have been made of plastics. Ac-

cording to Dr. J. D. Ryan, research director for Libbey - Owns - Ford Glass Co., no known plastic has the proper characteristics for extensive automotive glazing purposes.

While suitable for aircraft, he says, plastics still lack the important property of abrasion resistance. They tend to crack in relatively short periods of time under loads. And unless laminated, plastics tend to break up into large, sharp-edged fragments similar to plate glass. This presents a safety problem.

Heavier Materials Needed—For the bubble-type canopy, Dr. Ryan believes laminated safety glass will have to be used. It would mean using annealed glass with adequate strength built into the canopy by using heavy plastic interlayers and thicker glass. But this brings both weight and cost penalties.

Presently used ¼-in. laminated safety glass weighs 0.02188 psi and ¼-in. annealed plate glass 0.02267 psi. This compares with only 0.0116 psi for commonly used steel with a thickness of 0.041 in.

Less Freeloading — Weight-conscious automakers say that in the future, transparent materials are going to have to do their share in carrying the load. While the large windshields and backlights of present cars undoubtedly add some support to the roof, glass for the most part is getting a free ride.

Dr. G. B. Watkins, chairman of L-O-F's technical policy committee, recently discussed glass as a structural member of automobile bodies before the Society of Automotive Engineers.

Tips From Planemakers — He said that even though well annealed plate and sheet glass has a tensile

strength of 6000 psi, and much greater compressional strength, it has a wide variation of breaking loads as compared with metals in tests.

Aircraft safety glass, he said, may serve as a guide to future structural uses of glass in automobiles—particularly its special "edge construction" which uses an extended plastic interlayer for mounting the glass.

Many Handicaps — But present aircraft windshields are made of a five-layer glass - plastic sandwich. They have an overall thickness of 1½-in. and weigh about 14 lb per sq ft.

Along with weight and safety problems for both plastic and glass, and combinations of the two, there are many manufacturing problems.

We Almost Forgot — Finally, what about the customer? A clear, transparent top would soon turn the interior of a car into a small solar oven. A GM engineer noted the problems in photographing Firebird III under a hot, Arizona sun.

Automotive Production

WEEK ENDING	CARS T	RUCKS	
Feb. 7, 1959	117,050	25,142	
Jan. 31, 1959	119,678	24,938	
Feb. 8, 1958	109,028	19,481	
Feb. 2, 1958	104,359	18,355	
TO DATE 1959	662,817	123,210	
TO DATE 1958	598,385	101,283	
*Preliminary	Source: Ward's	Reports	

Even with air conditioning, photographers had trouble coaxing riders to sit in the car long enough to take pictures. For non-picture taking purposes, GM has another set of bubble canopies which have been vacuum coated to reflect much of the sun's rays.

But then, what's the use in having a see-through top that's opaque? It's likely there will be some increase in the glass area on cars to be produced in the next few years. But it doesn't look like we'll be telling service station attendants: "And clean the roof, please."

AMC Has Big Plans For Small Cars

American Motors Corp., rolling along smoothly on a cushion of profits and a fat stack of orders from its dealers, isn't too worried about its future in the automobile business—nor is it complacent.

Last week AMC president George Romney, apostle of the "compact" car, told stockholders the company must be prepared to expand to meet the full potential of the small car market.

Big 3 May Move In—AMC is already in the midst of a \$10 million expansion program that will boost its capacity to 440,000 units from the present 330,000 units.

But Mr. Romney is already looking beyond this. The company, he said, is planning on the basis of meeting "head - on competition" from Rambler-size cars expected to be built by the Big Three.

More Spending Needed—The next logical move, he said, would be to expand AMC's capacity to 660,000 units per year.

The Bull of the Woods





Redesigning this vacuum tube base cut manufacturing costs by 50%.

The old base (shown at left) required seven operations from blanking the steel frame to staking the socket in position.

As a zinc die casting (shown at right), only one operation — punching the tube pin slot — was necessary. By die casting this part from zinc rather than from aluminum, the following additional advantages were achieved:

- . . . Less draft on the socket
- . . . Greater overall strength
- . . . Lower die cost

For similar savings review your metal parts that possibly can be produced as ZAMAK alloy die castings.

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Braze and Anneal at operating 2150° temperatures from 400° F to 2150° F

Model 88 Bell Retort Furnace.

AGF'S BELL RETORT **FURNACES**



AGF'S CAR TYPE BELL RETORT FURNACES

Designed to meet the need for large capacity batch type stainless processing . . . for handling unusually shaped pieces or heavy work loads. Box shaped bell retort is rolled into and withdrawn from the furnace by means of a chain driven mechanism. Bell Retort cover is easily removed for loading and unloading.

Model 239 Bell Retort Furnace. Box shaped car type retort.

Rapid and efficient heating is obtained because the bell retort is charged into a hot furnace.

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"The Standard of the Industry Since 1878"

Inflation Now Worries Nixon

He'll Talk It Over With Management and Labor

Vice President will aim to get management to hold the line on prices.

And he'll try to talk unions out of demanding wage hikes in this year's labor negotiations. — By G. H. Baker.

 Vice President Nixon is now convinced inflation is our most serious domestic problem.

In the weeks ahead, he plans to meet with top-level management and union officials to find ways of stalling off higher prices and higher wages. Whether Mr. Nixon can succeed is a question.

Tough Job—Certainly it will not be easy to sell either management or unions on the idea. Every passing week brings higher costs of one kind or another to manufacturers. Except in those rare instances where higher costs can be absorbed, the extra charges are passed on to the ultimate purchaser—the consumer.

Union chiefs, aware of this trend, are planning to go all the way this year in their demands for higher wages and related benefits. Example: President McDonald, of the AFL - CIO United Steelworkers' union, plans an all-out push this Spring for substantial improvement in wages and benefits. And he is making it clear his members are prepared to strike if necessary. Steel management appears equally determined to resist big demands from McDonald.

From the Cabinet—Mr. Nixon says he'll call on the President's Cabinet for data and advice on how

to avoid new cost and price increases. Conferences with management and unions are to get under way in Washington soon.

Outlaw Right-to-Work?

All state right-to-work laws are in danger of being wiped out by a single blow from Congress.

The Democratic Advisory Committee is recommending a federal ban on all right-to-work laws. The big Democratic majorities in both Senate and House are ample to achieve this goal.

Some Do, Some Don't — The Taft-Hartley law says states can enact right-to-work laws if they want. Nineteen states have declared a worker doesn't have to join a union if he doesn't want to. But states where unions are strong

(Ohio, California, for example) have overwhelmingly rejected right-to-work proposals.

National Right-To-Work Committee (an organization of businessmen fighting for right-to-work laws) warns that unions are lobbying aggressively this year in the Senate and House for cancellation of right-to-work laws.

Franke to Head Navy

William B. Franke, will become Navy Secretary on June 1.

Mr. Franke, Under Secretary of the Navy since 1957, will succeed Thomas S. Gates, Jr. Though the White House has accepted his resignation, Mr. Gates will remain to testify before Congress on the new Navy budget.

Political School For Business

Art or Science?—Political education of businessmen is finally under way. The U. S. Chamber of Commerce is the teacher.

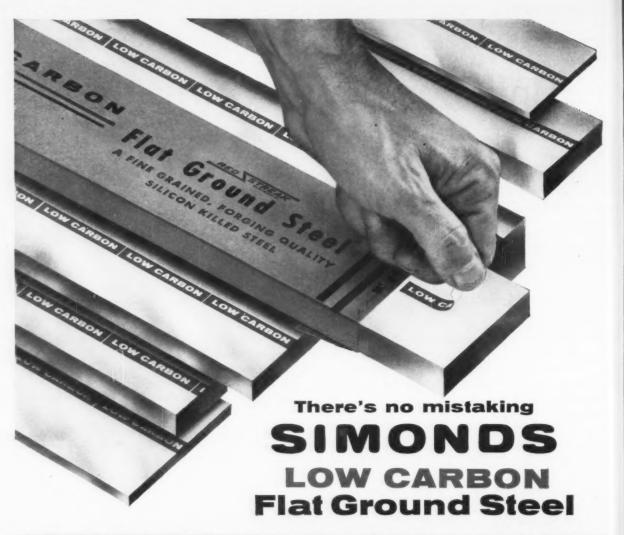
But the Chamber is careful to point out it is confining instruction to the mechanics of U. S. politics, and steering clear of any partisan discussions. If the Chamber prefers Republicans it is not saying so in so many words.

Traditional Rivalry—The political school is frankly presented as a force to offset the AFL-CIO Committee on Political Education (COPE) an aggressive, hard-hitting political group credited with the

election of many Democrats to federal, state, and city offices.

It appears that business management must either combat COPE or eventually be overrun by it. The Republican party in Washington estimates COPE produced about half of the six million-vote majority pulled by Democrats in winning the U. S. Congress in November, 1958

The Culprit—Republicans who were defeated almost unanimously blame their defeat on COPE and its vigorous campaigning on the behalf of Democrats.



LOW CARBON LOW CARBON LOW

with this NEW Full-Length Labeling

ON ROW CONCARDO

There's no confusion with other types of steel, when you use Simonds Low Carbon Flat Ground Steel. For this new product is readily identified by the full-length, peel-off tape. What's more, this modern labeling does not mar the bar . . . does not interfere with scribing . . . leaves no trace when removed.

This new low-cost steel completes the Simonds line . . . OIL and AIR Hardening Die Steels, and now LOW CARBON Flat Ground Steel as well. All three types are made to the same close tolerances, with the same extra smooth surface finish and good machinability.

Simonds Low Carbon Steel comes in flats from $\frac{1}{16}$ " to $1\frac{1}{2}$ " thick, and $\frac{1}{2}$ " to 16" wide; also in squares from $\frac{3}{8}$ " to $2\frac{1}{8}$ ". All stock sizes come in standard, ready-to-use 24" lengths, individually packaged. Special sizes on order. Call your Simonds Distributor now.

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How Kaiser Steel Joined Top Ten

Expansion Almost Doubled Steelmaking Capacity

With dedication of three new oxygen furnaces Kaiser has closed out its current \$214 million expansion program.

But already new spending plans are getting serious attention.—By R. R. Kay.

• Step by step the Farwest's steelmaking industry is going big time.

Three oxygen steelmaking furnaces are now installed at Kaiser Steel's Fontana, Calif., Works. The first 100-ton heat was poured with ceremony while TV cameras recorded it.

Tonnage Almost Doubled — Readying of these furnaces closes out the company's \$214 million dollar expansion program. Rated ingot capacity is now almost doubled—from 1,536,000 tons to 2,933,000 tons per year.

The money went for: (1) three basic oxygen steelmaking furnaces, installed by Kaiser Engineers; (2) a fourth blast furnace; (3) an 86-in. strip mill; (4) expansion of the tinplate mill, which includes the Coast's first continuous annealer; (5) a plate mill to roll material up to 126-in widths; (6) a universal slabbing mill; (7) ninety coke ovens; (8) ten soaking pits; and (9) improvements in the company's mines.

Oxygen's Future—By 1965, according to Kaiser Engineers, L-D Process (oxygen converter) installations in the U. S. will produce 45 million tons, or 25 pct of our steel-making capacity.

Kaiser Steel first opened shop in 1942. The current \$214 million expansion brings the company's total investment to one-half billion dollars.

Coming Events—What's ahead now? Jack L. Ashby, vice-president and general manager, says, "Here are some of the possibilities we're considering for the near future—all of which involve new capital expenditures:

"We plan to produce 20-ton hot top ingots to roll in our new slabbing mill. This would provide a welcome increase in the range of products we offer our customers. We could supply heavier plates in the hot top quality grades.

"Also, we could extend our range of universal mill plate lengths by installing a straightener in the 29in. mill.

"If we add finishing facilities in

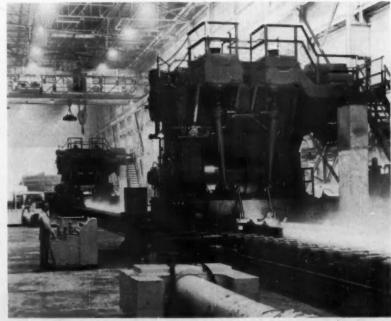
our 86-in. mill, we can offer more hot rolled sheets and give better services on this product.

"And at Eagle Mountain we're studying major changes and modifications to our iron ore beneficiation plant."

Market Probe—With today's increased steelmaking capacity, Mr. Ashby expects Kaiser will reach out to more distant markets. He says his company is trying to jack up sales in the Pacific Northwest, in the inter-mountain area, and, on some products, even as far east as the Mississippi.

And with extra steel now available, the company is going "all out" to increase its export sales.

From Slab to Coiler in Two Minutes



RAPID TRIP: At Kaiser Steel's new strip mill a slab travels from furnace to rolling mills to coiler in about two minutes.

New turning idea is born...

LeBlond Engineers turn trick with tracer



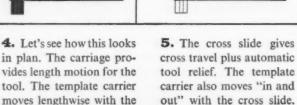


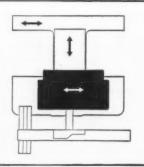


- **1.** Problem workpiece—spiral rotor for pumps manufactured by Roots-Connersville Blower Co., Connersville, Indiana. Shaping just couldn't produce the wide variety of exact contours their engineers wanted. Could rotors be *turned*—automatically?
- **2.** Why not? With special end gearing and full nut, we can "chase" the spiral shape like a coarse thread. That's easy...the problem is the contour.
- **3.** We'll use Hydra-Trace to position the tool (not to trace). We can mount a special length slide on the cross slide to give us feed between cuts.

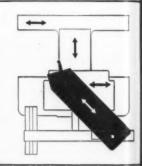


carriage.

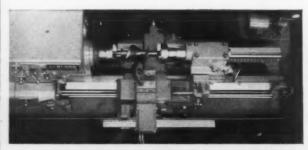




6. The special length slide gives us feed. Not continuous feed. Just tool-positioning feed that moves the stylus along the template for each successive cut.



7. The template controlled Hydra-Trace positions the tool to produce the contour. During the cut, no feed takes place. Only the chasing action.



8. Here's the finished machine—the LeBlond Contour Chasing Lathe, basically a 32" Standard Duty. Modifications include: special end gearing, full nut, special length slide, automatic cycling and special heavy duty reversing electrics. Lathe chases leads from $4\frac{1}{2}$ " to 16".

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Cincinnati 8, Ohio



We welcome the opportunity to solve your special turning problems. Tell us about them. Call or write for an engineering appointment.

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Builders List Their Problems

They Say Weak Tool Industry Hurts Our Defense

The recession dealt the U.S. machine tool builders a mighty blow.

Along with other problems it sank U. S. output sharply below the Reds'.—By E. J. Egan, Jr.

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■ Does a recession - weary machine tool industry weaken America's defense potential? Machine tool builders know from experience how vital they've been to the country's military might. Certain government officials remember, too.

Yet, observers estimate the industry's total machine tool output last year at only about 34,000 units. A vigorous Soviet effort is reported to have produced 138,000 machine tools.

No Wonder Sales Sagged—The problem is serious. U. S. builders have not only been hit by the recession, they've been underbid in their own back yards by foreign builders, blocked off from overseas markets by dollar shortages and Common Market barriers, and shackled by unrealistic depreciation allowances at every turn.

Some aspects of the problem were outlined recently to a student group of high ranking military officers and government officials from the Industrial College of the Armed Forces. The group, currently assigned to study the machine tool industry's role in the defense picture, got the word on a field trip to the Landis Tool Co., Waynesboro, Pa.

If You Can't Beat 'Em — As an outgrowth of the foreign competition problem, M. A. Hollengreen, Landis' president, said that his company recently acquired the second

largest manufacturer of grinders in England as a subsidiary. Noting that many other U. S. builders have set up plants or licensees abroad, he said: "We didn't want to go to Europe but we had to."

The Landis move, like those of other American builders, was made primarily so the company could compete more effectively for overseas business.

Reverse English — But Mr. Hollengreen reminded his audience that, "We can build one of our standard grinders in England, pay all shipping and tariff charges, and put it on the receiving dock of this plant for 30 pct less than it costs to build the same machine here and get it no further than the shipping platform."

John Williams, chief of the Pro-

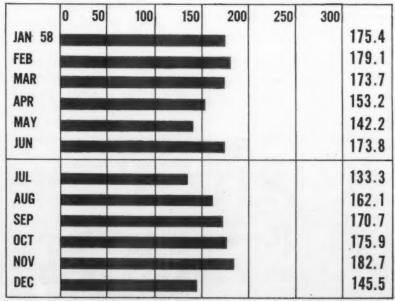
duction Equipment Branch in the Defense Dept.'s Supply & Logistics section, told the group. "To make only 34,000 machine tools a year in this country is a catastrophe," he said.

Stakes Are High — To solve the problem, Mr. Williams observed, "We've got to build the best machine tools in the world and at a reasonable price. The industry needs salesmen who can make the advantages of buying new machines unmistakably clear to all who need them. And some way must be made available for customers to finance their purchases."

He warned, "What's at stake is the salvation of the machine tool industry, indeed the salvation of U. S. defense capacity."

GEAR INDEX 1958

Base 1947—49=100



Source: American Gear Manufacturers Assn.

INDUSTRIAL BRIEFS

Allis-Chalmers Twentieth—Allis-Chalmers has acquired the S. Morgan Smith Co., York, Pa. The York Works of Allis-Chalmers, as it will be known, becomes the 20th plant in the A-C family. Acquisition was made through the exchange of 1.1 shares of A-C common for each share of SMS capital stock outstanding.

Merger Pending—Kaiser Aluminum & Chemical Corp. and Mexico Refractories Co. of Mexico, Mo., have begun negotiations which may lead to a possible merger.

Diecasters Note—Koehring Co., has acquired the business of Cast-Master, Inc., Bedford, O., manufacturers of diecasting machines. It is expected to add about \$4 million to Koehring's annual sales. Purchase price of the Ohio firm, involving an exchange of stock, was in excess of \$1.5 million.

Kellogg Process Changes Hands
—Firth Sterling Inc., Pittsburgh, acquired the Kellogg specialty alloy steel manufacturing business from The M. W. Kellogg Co., a subsidiary of Pullman Incorporated. Firth Sterling acquired all patents, inventories, and production facilities of the Kellogg ingot process.



"Production grinding."

Heat Treat Service—Industrial Metal Treating Corp., Charlotte, N. C., on Jan. 26 began providing commercial heat treating facilities as a service to the metalworking industry of the Southeast. The new corporation is headed by president W. R. DeVita and vice president, L. E. Chaundy, Jr.

Alchem Buys Perfection — The Aluminum & Chemical Corp., Greenwich, Conn., has purchased Perfection Metals Products, Inc., Birmingham, Ala. Perfection will continue operations as a division of Alchem. It was founded in '46 by Clyde Winter, who remains as president and general manager. B. K. Sirois, will join the Perfection Div. as vice president.

More Specific — The Brown Thermal Development Co. has changed its name to The Brown Thermal Products Corp. Brown Thermal not only develops and engineers, but manufactures, markets, and services heat transfer products used by metalworking industries.

Detroit Trend—American Metal Products Co., Detroit, has acquired the Davis Engineering Corp., Elizabeth, N. J. The purchase of the engineering company is another step in American Metal Products to diversify its metalworking activities into fields in addition to automotive supply.

Uncle Sam's No. 1 Nephew—Robert A. Beall, Dept. of the Interior scientist of Albany, Ore., received in Washington, D. C. the Arthur S. Flemming Award given annually to outstanding young men in the Federal Government. He is internationally recognized as an authority on the melting and casting of rare and reactive metals.

It Pays to Think—Ideas paid top dividends at U. S. Steel during '58 with employees collecting more than \$375,000 under the Corporation's employee suggestion plan. This plan covers all hourly rated and certain salaried personnel.

Top Gas Man—Stanley B. Kirk, former president, Linde Co., a division of Union Carbide Corp., will be awarded the James Turner Morehead Medal by the International Acetylene Assn. at its anniversary convention in New Orleans on March 9-10. Mr. Kirk will be honored for his contributions to the use of calcium carbide, acetylene, oxygen, and other industrial gases.

Australian Expansion — Union Carbide Corp., plans to build a polyethylene plant in Melbourne, Australia. Operations are scheduled to begin in 1961 with initial capacity of 15 million lb annually. The plant's output will beef up the corporation's Australian affiliate, Union Carbide Australia Ltd., which will erect and operate the facility.

New Name — Michigan Drill Head Co., Warren, Mich., a name associated with the machine tool industry since 1936, has changed its name to Michigan Special Machine Co.

Can Plant for Pascagoula—Ground breaking ceremonies were held at Pascagoula, Miss., for a \$1 million Continental Can Co. manufacturing plant. It is expected to begin operations in August with an initial output of 180 million cans per year. R. E. Zarbock, manager of the company's Harvey, La., plant., will also manage the Pascagoula plant.

Open for Business—The Cullman Products Div., Serrick Co., makers of aluminum, stainless steel, and anodized trim for automobiles, is in production. When in full operation, the Cullman, Ala., plant will have about 130 production workers. Construction of the new plant was completed recently.

Coastal Move—Western regional sales headquarters of the Alloy Tube Div., The Carpenter Steel Co., Union, N. J., has been moved from San Francisco to 2304 Huntington Drive, San Marino, Los Angeles.



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Delicate Swedish steel reed, 10/1000" thick being finished, by Westinghouse, in the Vibraslide.

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— and to *make* sure, Westinghouse sets highest quality standards for refrigerant compressor valves. No stress points likely to shorten life are allowed to impair the delicate Swedish steel reeds that have such a tough job to do.

At the Columbus, Ohio, Westinghouse refrigerator plant, a VIBRA-SLIDE method deburrs, forms radii, and removes shear marks, even in the hard-to-reach areas of these precision stampings.

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AND

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OHIO



A. M. Cole, named executive vice president, Reynolds Aluminum Service Corp., a Reynolds Metals subsidiary, Richmond, Va.

- F. K. McCune, will become vice president, Atomic Business Development in Marketing Services, General Electric Co., Schenectady, N. Y.
- W. B. Nicholson, appointed vice president, Linde Co., Div. of Union Carbide Corp.; R. F. Flood, named vice president, gas products.
- J. F. Shanklin, elected secretary, Union Carbide Corp.
- T. W. Sill, Jr., appointed sales development manager, Peter A. Frasse & Co., Inc., New York.
- D. M. McDowell, appointed director, engineering, Roots-Connersville Blower Div., Dresser Industries, Inc., Connersville, Ind.



Phillips Hawkins, appointed vice president, international and raw materials—staff, U. S. Steel Corp.

- J. S. Miller, appointed Southwest district manager, Cleveland Forge Works, Cleveland, O., Forge and Fittings Div., H. K. Porter Co., Inc.
- **F. J. Zupancic,** named superintendent, Electrical Dept., Republic Steel Corp.'s Warren plant.
- W. D. Fullerton, appointed assistant general manager and W. L. Fabianic, named director, research, Refractories Div., H. K. Porter Co., Inc.
- **J. A. Brickett,** appointed sales manager, Arcos Corp., Philadelphia.
- A. C. Anderson, named technical director, A. O. Smith Corp.'s new Reinforced Plastics Div., Milwaukee, Wis.; D. H. Davis, appointed controller and administrative assistant of the division.
- F. W. Voss, appointed assistant manager, sales, Cincinnati district sales office, U. S. Steel Corp.; D. P. Selby, named manager, sales, Cincinnati district.
- F. X. Kinzie, L. B. Clay, and H. M. Cassel, appointed district sales manager, Los Angeles, Calif., steel service plant, Joseph T. Ryerson & Son, Inc.



R. M. Waples, elected chairman of the board, The Garlock Packing Co., Palmyra, N. Y.

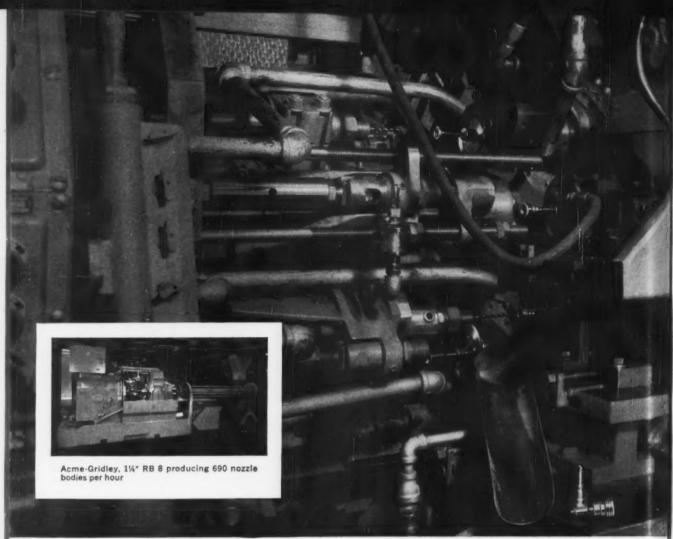


L. P. Favorite, elected vice president, product sales and distribution, Aluminum Co. of America, Pittsburgh.

- J. J. Yonakor, appointed superintendent, General Labor Dept., Cleveland steel plant, Republic Steel Corp.; James Cunningham, named asst. superintendent of the department.
- **B. E. Smith,** named general manager, Hydraulic Div., York, Pa., Works, Allis-Chalmers Industries Group.
- G. D. Brengelman, named general superintendent, Fairfield Steel Works; H. W. Bullard, superin-



A. J. McMullen, named president and chief executive officer, The Garlock Packing Co.



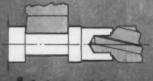
Close-up of tooling zone showing 5th, 6th and 7th positions.

ACME-GRIDLEY ELIMINATES SECONDARY OPERATIONS...

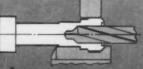
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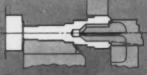
* Details on request



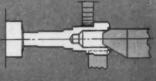
 Feed out—rough form rear diameter—counterbore and drill large hole part way



Form two front diameters
and chamfer head—drill large
hole remainder—support



2. Form two rear diameters—ream large hale—fare end—support



3. Stop spindle retation mill flat—support

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Spot Modernization: pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.

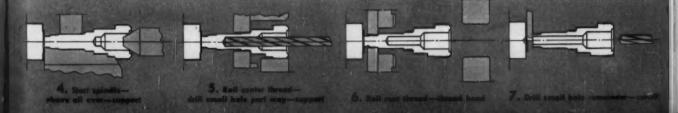
As a part of a continuing contribution to all phases of cost reduction, National Acme engineers initiated the development work necessary to effect important savings for this 65 year old Wellsburg, W. Virginia company.

The aluminum nozzle body of their hydraulic pump oilers formerly had been produced on a six spindle automatic and two other machines performing secondary operations. Visionary machine tool engineering made possible the application of spindle stopping and positioning on an eight-spindle Acme-Gridley to complete the entire piece in the primary set-up . . . and increase net production.

Advanced design and development such as this, together with wide open tooling zones, independently operated tool slides and the extreme accuracy and flexibility of direct camming . . . makes possible the solution of "unusual" jobs an "every day" occurrence at National Acme.

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tendent, Ensley Steel Works and E. K. Graham, asst. general superintendent, Fairfield Works, U. S. Steel's Tennessee Coal & Iron Div., Birmingham, Ala.

G. F. Rucker, named manager, Market Development Div., Marketing Dept., Leeds & Northrup Co., Philadelphia; S. B. Biddle, Jr., named manager, Los Angeles; J. E. Reed, manager, Seattle office; and R. D. Failor, manager, Salt Lake City. E. P. Bassett, named manager, federal government and prime contractor operations, The Filmsort Co., Pearl River, N. Y., a division of Miehle-Goss-Dexter, Inc.; J. C. Weigers, named technical representative; and E. W. Selis, chief engineer.

D. H. Phipps, appointed exclusive distributor of Verson equipment in Massachusetts, Connecticut and Rhode Island, Verson Allsteel Press Co., Chicago and Dallas.

G. L. Cox, named technical manager, Rochester, N. Y., headquarters, Whitehead Metals, Inc., a subsidiary of International Nickel Co., Inc.

R. D. Butler, appointed sales manager, plug valves, W-K-M, a division of ACF Industries, Inc., Houston, Texas.



R. C. Corns, appointed general superintendent, National Tube's Gary, Ind., plant, U. S. Steel Corp.



E. P. Best, appointed director, metallurgy and research, A. M. Byers Co., Pittsburgh.

W. J. Freeman, appointed manager, Nickel Refining Div., The International Nickel Co. of Canada, Ltd., Port Colborne, Ontario.

A. C. Densmore, appointed manager, Detroit office, The National Acme Co., Cleveland.

J. M. Sarver, appointed New York district sales supervisor, Ansco, the photographic manufacturing

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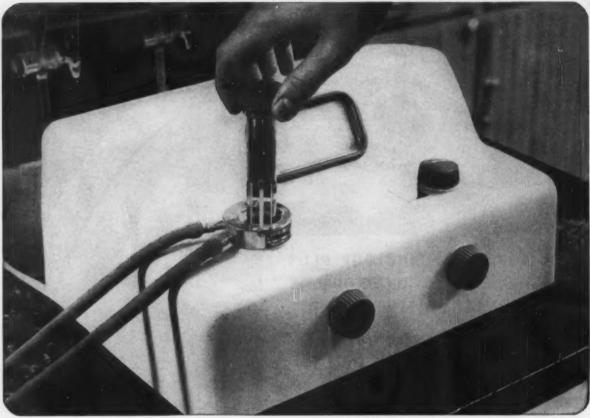
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Accurate adjustment of alloys guarantees uniform heat treatment, predictable dimensional changes, reduced grinding, standardized machining operations.

Close control of molybdenum, tungsten, cobalt and manganese is at the heart of a good tool steel melt. In addition to the usual testing methods, Allegheny Ludlum's chemical laboratory checks these metals with Colorimetry because of its inherent, extreme accuracy.

On the basis of the Colorimeter's findings, it is possible to make carefully calculated furnace additions of fetro-alloys, insuring precise control over chemistry. This guarantees your receiving the exact analysis order after order, providing uniformity of heat treatment, predictable dimensional changes, reduced grinding and standardized machining operations.

Colorimetry is but one step toward careful control over composition. Allegheny Ludlum also sets exacting purchasing specifications on raw materials and scrap. Quality Control checks all incoming orders to see that they conform with these specifications. Another guard toward your getting your exact specifications: each ingot bears a metal tab showing heat number.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier.

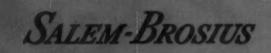
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adds two new divisions to widen its scope of service to industry

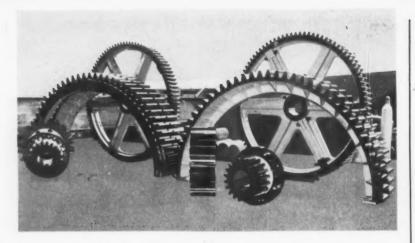
Salem-Brosius recently acquired Alloy Manufacturing Corp. of Pittsburgh and now, through that subsidiary, has purchased the R. H. Freitag Manufacturing Co. of Akron, Ohio. To those who know both companies, the benefits the new team will bring to industry are self-evident.

Freitag Manufacturing Co. of Akron, Ohio. To those who know both companies, the benefits the new team will bring to industry are self-evident.

Atomic energy is a case in point. Alloy specializes in precision fabrication and welding of parts for nuclear reactors, while Freitag machines and finishes the same equipment... thus making Salem-Brosius an integrated supplier to atomic prime contractors. The added service capacity of the new combined facility also will benefit all other industries that require precision finished parts and equipment.

CARNEGIE PENNSYLVANIA

Seism Ingineering Co. Ltd., Allford, En Seism Engineering Limited, Toronto, On Seism-Brooks, S. A., Luxembourg Solom-Brooks, S. A., Peris, Franco Alloy Manufacturing Corp., Physherek, Pa. R. M. Freiteg Manufacturing Co., Abron, Chie



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division of General Aniline & Film Corp.; Harry Panko, appointed manager, professional and technical sales promotion for Ansco, Binghamton, N. Y.

W. P. Johnson, appointed sales manager, Metal Building Div., United Steel Fabricators, Inc., Wooster, O.



M. L. Bernstein, named chief engineer, Wheeling Steel Corp., Wheeling, W. Va.



Alan Seligson, named executive assistant to the president, Tube Distributors Co., Inc., Garden City, L. I., N. Y.

J. F. Zboyovsky, appointed sales manager, Delta-Star Electric Division's Thomas Works in Lisbon, O., H. K. Porter Co., Inc.; W. C. Carpenter, appointed assistant to the manager, Thomas Works.

E. A. Nelson, named market research manager, Planning Dept., Bucyrus-Erie Co., S. Milwaukee.

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Cold Extrusion Shows One Way To Diversify With Profit

Cold extrusion is tricky, but it's not as tough as you may think. It can pay off handsomely —if you choose your parts with care.

By R. H. Eshelman Engineering Editor

■ Can your plant branch out into cold extrusion and make it pay? Where should it be considered? What equipment is needed to start?

These are important questions if you think cold extrusion might help you meet the challenge of higher labor costs and narrowing markets. At last there are some rather authoritative answers at hand.

It's well known that automotive companies are cold extruding millions of piston pins and assorted other pieces. But it's unique to find a screw machine shop extruding a small, gear-like part with a highly automatic press setup. Moreover, the shop's technique is as advanced as any, according to Parker Rust-Proof Co. experts.

Foresee a Market—The company is M & S Mfg., in Hudson, Mich. Right now it's one of many screw machine specialists in the Detroit area, but cold extrusion looms big in its future picture. As vice president D. A. Lillywhite puts it: "We're in cold extrusion to the hilt. We can see where it will supplement our present facilities, give us greater product versatility and a better competitive position."

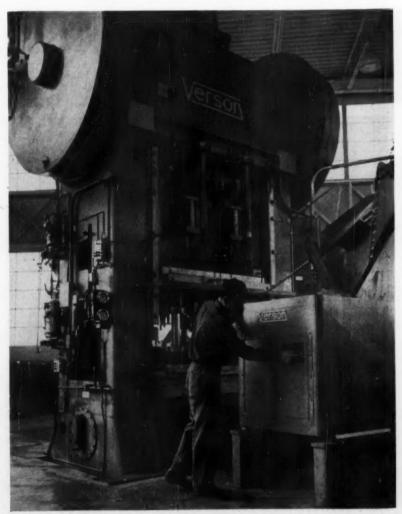
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There are many parts now made by other methods that can probably be cold extruded cheaper, faster, and better. These range from cupshaped pieces like universal joint bearings, to long, thin cylindrical sections and shafts. Having a smooth-running extrusion setup in operation gives M & S a head start in this field.

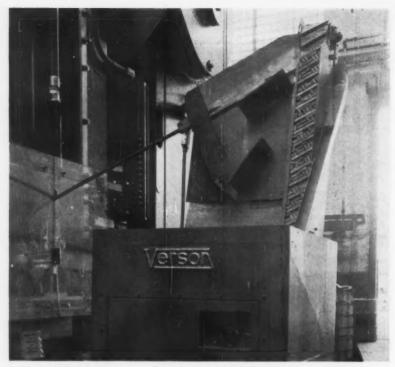
Choosing a Part—The big thing in cold extrusion is to select work-pieces that are well suited to the process. Much past experience—especially military, has been with

big parts (such as shells) and big presses. This may have created a false impression. You can probably do better by starting with smaller parts and setups.

Cold extrusion does improve the mechanical properties of workpieces. But savings on materials and in processing can prove even more important. This leads to some gen-



EXTRUSION AUTOMATION: Duplicate tooling setup and a hopper-elevator feed unit are features of M & S Mfg.'s automatic cold-extrusion press.



STOP AND GO: When supply of blanks falls below the level of an electronic eye on the press-feed chute, the elevator starts to operate.



PRODUCTION STEPS: Gear-like extrusion starts as slug cut from bar stock (left). Slug is cold extruded (lower left), then coined to final shape (lower right). Two top photos show bottom side of the part.

eral principles (distilled from M & S' experience) for choosing the right kind of parts to extrude:

First, can you achieve a major saving on material? On the rotary door-latch parts M & S extrudes, this saving runs from 60 to 65 pct.

Avoid Extra Steps—Second, you must have a shape that doesn't require too many secondary or finishing operations. A symmetrical design helps. But because extrusion tooling is still developed largely by cut-and-try methods, even experienced engineers can't tell in advance how a particular job will work.

Finally, there's the matter of production volume. Lillywhite notes that you can't expect to pay for elaborate tooling and equipment with a run of a few thousand parts. Cold extrusion may still pay, however, if you have a good press, an experienced tooling source, and a high-volume part that will remain standard for several years.

Tooling Makes It—Impact extrusion of the door-latch component at M & S starts with a cylindrical, phosphate-coated slug of SAE 1010 steel. Cold forming is done in two hits. The first one rough-forms the slug; the second coins it to a finished shape.

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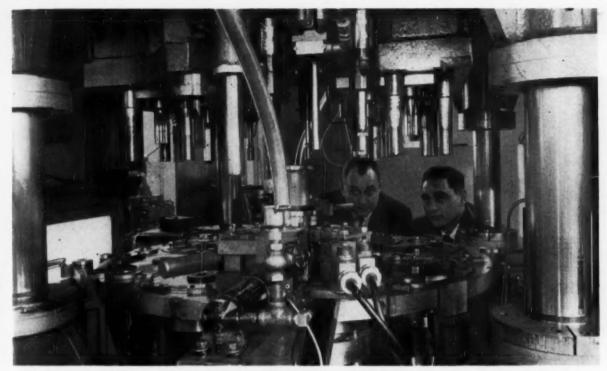
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Press tooling is built around a circular, indexing die. An ingenious arrangement of duplicate stations allows two parts to be made simultaneously. With an operating cycle of 25 strokes per minute, expected output at 100 pct efficiency is 50 pieces per minute.

Automatic Feed — An elevator hopper feeds blanks to the press. To avoid agitating the slugs excessively and knocking off the phosphate coating, it operates only on demand. An electronic eye on the gravity feed chute controls the hopper, energizing it when slugs are needed.

From the extrusion press, parts go to a drill press which is modified and tooled for one-stroke deburring. Here, too, parts are hopper fed.



MERRY-GO-ROUND: M & S Mfg.'s D. A. Lillywhite (left) and G. W. Fiddyment study twin tooling setups.

They go through a 12-station work fixture which indexes automatically with the air feed of the drill press.

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Deburred parts are then washed and broached. They're automatically fed through the washer, which removes the cutting fluid and chips left from deburring. Next, the hub of each gear-like part is broached on two opposite sides to produce parallel flats. For broaching, parts are gravity-fed to an air cylinder. They're held by an air clamp.

The company plans to fully automate the entire setup by linking the three processing steps with automatic handling equipment.

Quality is High—Despite the speed of these operations, M & S maintains close tolerances and consistently high quality in its extruded parts. Blanks weigh from 60.5 to 61.5 grams to begin with. The press operation holds the diameter of each part to within 0.003 in. while maintaining correct form in the workpiece. Overall accuracy is quite satisfactory for parts of this type.

Tolerances on the broached flats

are: 0.005 in. for depth and 0.003 in. for width. As the company gains experience it expects to be able to extrude these parts to even closer limits, if necessary.

Secondary operations needed to produce the extrusions include (1) cutting off the slugs in a screw machine, (2) phosphate-coating these blanks, and (3) case hardening finished workpieces.

Uses Whole Blank—On both time and material, extrusion brings the company substantial savings. The cost of raw material either to machine or extrude these parts is about the same per cwt, but there is this difference: Extrusion uses virtually all of the blank, whereas a screw machine, even using bar stock drawn to a special star-shaped cross section, still machines a lot of metal away in the form of chips.

However, Glen Fiddyment, M & S manufacturing engineer, warns: "This is no cure-all. Don't expect it to do everything." He cites a parallel in plastics and powder metallurgy—two other processes that were once boomed as panaceas

for metalworking problems.

Special Press—To meet M & S' requirements for a fully automatic operation, the cold extrusion press was designed with some special features. It's a 500-ton Verson—a double-crank, single-action type, with extra wide housings to resist impact deflection. Stroke of the slide is 14 in., and shut height (bolster to slide) is 30 in.

Other features of the press include combination air and positive mechanical knockouts, plus a fault-indicating safety system. The press stops instantly if an indicator shows possible interference or other failure in its functioning. As an added safety measure, an automatic system recirculates lubricant to all press, die-cushion, feed, and tooling components.

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When to Gun Drill and Ream

Better Tools and Techniques Bring Users Important Savings

By Herbert Gregg-Chief Engineer, Star Cutter Co., Farmington, Mich.

It's a new era for gun drilling and reaming. Modern, fast-cutting tools save time and money in precision hole-making.

• Once gun drilling and reaming were thought of primarily for deep holes. Because of allied difficulties these processes were used virtually as a last resort.

This is no longer true. New developments in both techniques, and in carbide tools, let manufacturers put precision holes in a wide variety of materials and part shapes.

Savings with gun drilling and reaming stem from the production of true holes and excellent microfinishes. These results simplify the processing of parts in many cases.

Which Process—In gun drilling you can produce blind holes, or deep straight-through holes in one pass, without removing the tool from the work. This is possible because of the gun drill's design. With a tubular body and a hole in the tip, coolant feeds through constantly to the cutting edges, flushing chips back past the flutes and out of the hole.

With this process you can hold trueness and concentricity to a few thousandths in cast iron. Hole size is accurate within "tenths," and finishes of 25 to 50 microinches are common. We use two-flute drills on cast iron, aluminum, and bronze but recommend single-flute tools on steel.

Reaming in Production—In gun reaming you blow coolant and chips ahead of the tool. This process is often preferred in production setups that use automatic machine cycles and pre-cored or pre-drilled holes. It affords the same advantages of precision and finish as gun drilling, and it's handy where machines lack provisions for back-flushing of chips.

Contrary to rather general opinion, we do not feel that speed is an outstanding advantage of gun drilling. For instance, actual feed of a two-flute gun drill in cast iron may be 0.002 ipr. But the surface speed possible with a carbide tool may increase overall hole production compared with conventional drilling.

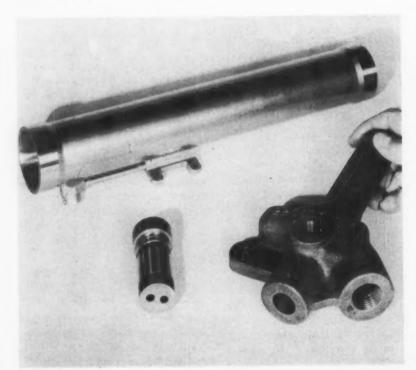
Good Tool Life—In a cast aluminum housing, for example, we have been reaming a ½-in. hole at 80 ipm. And we get 16,000 to 17,-000 holes per sharpening.

. A valve guide bushing offers an example of the potential savings in gun drilling a part made in large quantities. The former practice was to drill, rough, and finish ream the bushing, then turn the OD concentric with the hole. But it was difficult to hold tolerances this way.

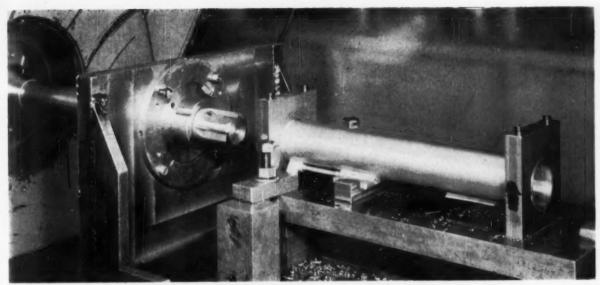
Now the manufacturer runs the part through a centerless grinder first to finish the OD. Then he gun drills the hole concentric (within 0.002 in.) with the OD. The new method is simpler, faster, more accurate, and cheaper.

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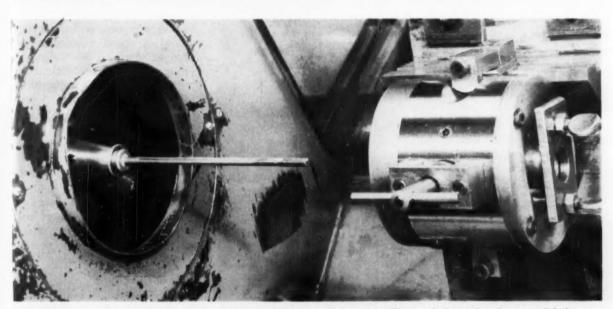
Finish Good, Too—Gun reaming often eliminates the need for boring and honing. A case in point involves a hydraulic valve part.



MANY KINDS: Typical parts where gun drilling or reaming pays. Size, shape, and materials vary widely. Precision is the common need.



TOUGH JOB: Special two-flute carbide reaming tool straightens hole in heat treated hydraulic cylinder.



TWIN HOLES: Carbide gun drill puts two 1/4-in. holes in tappet guide. Fixture indexes for the second hole.

Cross holes and recesses made it difficult to produce without bell-mouthing and washout. Design tolerances called for a hole straight and round within 0.0005 in. This and a 5 microinch finish were thought necessary to hold hydraulic pressures.

This cast iron valve body now has the 3/8-in. cored hole gun reamed to a final diameter of 0.750 in. The hole is 81/4 in. long. The reamer, operating at 1500 rpm,

feeds through a guide bushing at 12 ipm. Coolant pressure is 250 psi.

The reamed hole has a surface finish of from 30 to 50 microinches and needs no further finishing. The part holds higher pressures because it's more round and straight.

High Production—Each application is different. But we do have high production on gun drilling setups, too. An example is one we developed for producing two ¼-in. diam holes in a solid, cast iron blank. The part is a tappet guide. The holes must be parallel within 0.002 in. and concentric with the OD of the guide to the same tolerance.

We drill the holes one at a time in an index fixture, to a size tolerance of plus 0.001 in., minus 0.0000 in. Drill speed is 3500 rpm, and the feed rate is 12 ipm. This produces a surface finish in the holes of from 20 to 35 microinches.

Engineers Create Huge Bearing

Meet Demand for Precision Mounting of Missile-Search Radar

As you increase the size of precision bearings, design problems multiply.

It calls for special setups to meet severe tolerances.

• Defense and machine-tool needs are constantly pushing precision bearing limits upward. The latest to overcome previous size barriers is a 13 ft 9 in. diam ball bearing.

Made by The Kaydon Engineering Corp., Muskegon, Mich., it's designed for the support pedestal of a missile-detecting radar. The outsize bearing carries up to a 500-ton rotating dead weight.

Weighing 14,600 lb, the precision anti-friction unit uses 4-in. diam balls in continuous mass rotation. The development simplifies radar installations, since the bearing will take radial, thrust and overturn

loads. It avoids the need for additional bearings and gives weight and cost savings.

Computer Aids Design—One of the first steps was processing design data. Engineers took static and dynamic specifications to a digital computer.

Automatic calculations provided answers to factors such as bearing size, type, number and size of balls needed. This short cut lopped off months of development work.

Basically, the bearing consists of five rings: upper and lower outer races, upper and lower inner races, and data gear ring. Balls and separator segments complete the design.

Four-Point Contact — Meeting such severe service presents tough design problems with high-carbon chrome steel balls. Four-point contact on each ball turned out to be the answer.

Designers required the shop to maintain an almost perfectly parallel bearing surface. They set the bearing diameter tolerance at 0.002 in.

First step in manufacture was forging the five rings. Material is SAE 8660 steel. After forging, the shop machines the rings close to final tolerances, giving special attention to the ball grooves. Next, grooves are deep flame hardened to 58-63 Rc at the surface.

Control Hardness—For the heat treating operation Kaydon built a special rig to get close control of depth and hardness. The setup combines an acetylene torch, electronically controlled, and a power driven (cam type) fixture.

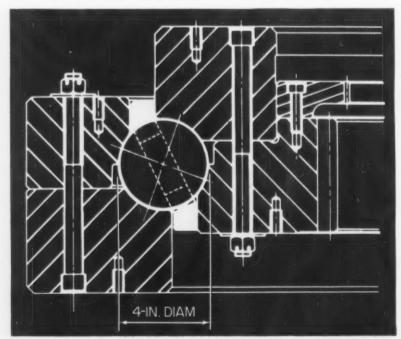
Each ring goes through Magnaflux inspection after heat treating. Then it goes into a circular tub for sub-zero treating for at least an hour at —120°F. This stabilizes the steel microstructure.

Grinding to tolerances is the final machining process. Having no machine large enough, Kaydon turned to their Frauenthal Div. to provide a unit with adequate capacity.

Build Grinder—By adding a special table, Frauenthal came up with an "elephant" grinder for the job. It takes bearing parts up to 178 in. The heavy bed prevents springing of parts out of true and gives 0.0002-ir. accuracies on concentricity and parallelism.

After first grinding, mounting holes in rings are drilled, tapped and reamed. Then gear teeth are cut.

When the rings are bolted together in subassemblies, the shop completes finish grinding exterior surfaces with parts set flat on the grinder in a free state. No finishing operation can be done safely on such parts in vertical position.



FROM FOUR ANGLES: Cross section of bearing shows four-point contact of 4-in. ball. Four rings are aligned to take load from any direction.

Minimize Handling — Operators never move the work until grinding operations are completed. This lets them get the highest possible accuracy. Minimum handling reduces chances of distortion, since the thin sections tend to sag under their own weight.

Components are finally assembled lying in the operating position. Inspectors check the complete assembly without moving it: face runout, eccentricity, starting and running torque, ball clearance and out-of-roundness.

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Electronic gages transmit dimensional data to an automatic recorder as the bearing is rotated. This furnishes a permanent graphic record.

Lab Conditions—Because of accuracies required, Kaydon encloses the grinder, operating and test equipment in a room with automatic temperature control. The grinder coolant is also maintained at the 71° ± 1°F with temperature continuously recorded.

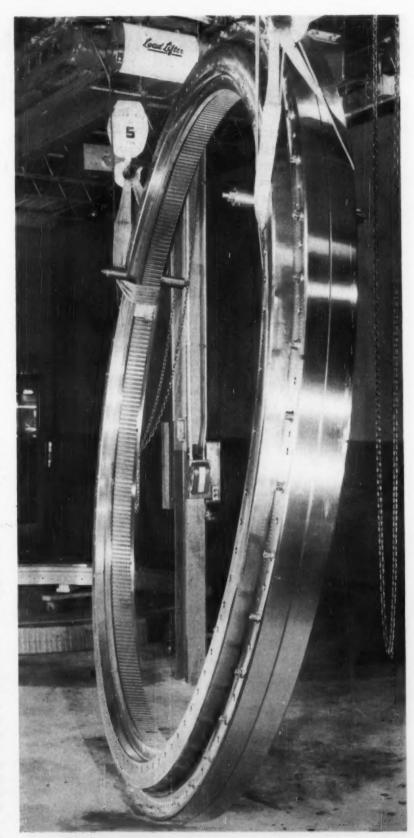
Even mist generated by the coolant is controlled by a special humidity control unit. The shop makes direct readings of both work and gages at specified intervals during grinding operations.

Each degree difference in temperature between gage and work amounts to about 0.001 inch. Consequently, 2°F is enough to take up the working tolerance of 0.002 in. on the large diameter. Kaydon checks out individual parts of the bearing to 0.0004 in. or less for concentricity and parallelism.

How to Ship—Shipping the bearing via truck presents a problem because of the danger of fretting corrosion from in-transit vibrations. Kaydon engineers devised a container with a steel frame which holds the bearing at a 30° angle on the trailer bed.

A small gasoline engine rotates the bearing continuously through a drive mechanism. A red light visible to the truck driver, monitors proper operation of the drive.

Kaydon is now designing a 60-ft diam bearing with replaceable segments.



LARGEST IN PRECISION?: That's what the designers claim for this precision hardened anti-friction bearing. Its outside diameter is 165 in.

Electronic Device Simulates Furnace Heating Problems

Whenever you heat metal in a furnace, you're locking horns with a tough heat transfer problem. How can you be sure you're getting the right answers?

This new electronic device could be the key to solving your furnace heating problems —in forging, heat treating, melting, and a host of other applications.

By P. M. Unterweiser Metallurgical Editor

• In the forge shop, it's a common occurrence. A steel billet comes out of the furnace. Its surface temperature is just right for forging. But what about the temperature at the center of the billet? Is it on the low side? If so, what can be done about it?

The problem is just as common to the heat treating shop. A bull gear leaves the hardening furnace. It is fed to an oil-quench tank. The temperature of the hardening furnace is correct in all respects—guaranteed by a battery of thermocouples. But is the bull gear evenly heated throughout its mass? Will uneven heating result in a rejected gear?

Avoids Risk — These are the kinds of questions that have been plaguing metalworking plants for years. The reason: critical heating problems have had to seek their answers on the basis of furnace temperature, or surface temperature, measurements alone.

In the forge shop, the heat treating shop, the rolling mill wherever metal temperature is a critical factor — depending solely on surface temperature measurements is risky. But what feasible alternatives have been available to these shops?

Thanks to Thermolog — a new temperature analog simulator — many complex heating (and cooling) problems can now be solved accurately and in a relatively short time.

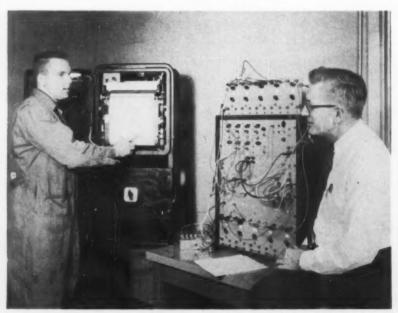
Plots Heating—Heat treating and forging problems are particularly suited to Thermolog analysis. But the simulator can just as readily tackle heat transfer problems that apply to nonmetallic materials, gases, or liquids.

Returning to our original examples, the new simulator can be used to accurately plot heat transfer from the outer surface of a forging billet to its center thus assuring proper forging temperature throughout the billet. Or it can predict time and heat input needed to achieve complete temperature uniformity in a steel part prior to quenching.

A special electronic device, Thermolog was developed by Selas Corp. of America, Dresher, Pa. It isn't for sale—but its services in problem solving are available on a contract basis. Included with the use of the simulator are the services of a trained engineering staff familiar with its operation.

Helps Furnace Design—According to Selas president, F. D. Hess: "Thermolog will solve many a thorny heat transfer problem, and we're glad to lease it to industry for that purpose. At the same time, we're confident that the answers Thermolog provides will help tremendously in designing and building better furnace and heating equipment."

Electronically, the new device is called a simulator because it assumes, the responses of any object



SIMULATOR: Setup consists of an electrical control panel (right) and an automatic, temperature recording unit (left).

or material subjected to transient heating. This means that any condition or variable that affects the heated object over a period of time can be identically reflected in the responses of the simulator. With the simulator, the need for running actual tests to determine heating performance is eliminated.

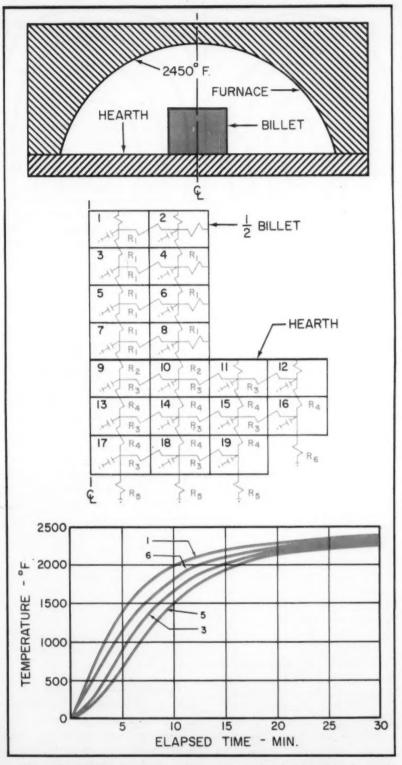
Acts as Substitute—The ability of the simulator to take the place of, or "stand in" for, the heated object stems from a mathematical relationship between the electronic circuit and actual heat transfer in materials. Certain electrical measurements (or values) can be directly and accurately substituted for heat measurements.

How can these factors be adjusted to fit each special case? The combined effect of the heat capacity and thermal conductivity is simulated by the combined effect of electrical capacity and electrical resistance. Therefore, only the electrical resistance need be changed while simulating changing heat capacity and thermal conductivity. This can be done during the heating process.

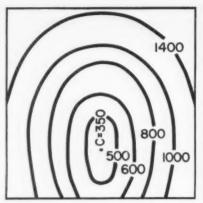
How can these factors be adjusted to fit each special case? Electrical capacitance can be controlled or altered by simply changing the applied voltage to a capacitor. Electrical resistance is regulated by means of a variable resistance element linked between capacitors.

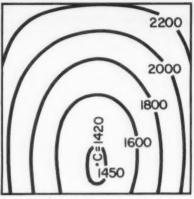
Test Run — Here is how this electronic vs heating relationship works out in practice. In a sample problem, let's assume we are heating a steel billet in a conventional furnace (see sketch). First, an electrical model of the actual billet is constructed by laying, out an analogous system of capacitors and resistors. The thermal characteristics of the furnace hearth (which will draw some heat away from the billet) are also simulated electrically.

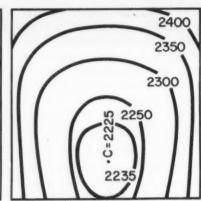
Assuming the furnace temperature is 2450°F, the billet will be heated by radiation from the



PROBLEM SOLVING: A test billet, shown in the furnace above, is represented by an electrical model below. The model consists of segments, simulating both the billet and the furnace hearth. Circuitry is made up of capacitors and resistors. The capacitors simulate the heat capacity in the billet. The resistors simulate its thermal conductivity. Curves plotted on the graph represent the time-temperature relation of numbered portions of the billet.







TIME VS TEMPERATURE: Isotherms plot the temperature of the billet from surface to center at the end of 4, 10, and 22 minutes. Furnace temperature is constant at 2450°F throughout the heating cycle.

Note the elapsed time required to achieve reasonable temperature uniformity in the billet. Even after 22 minutes of heating, a spread of more than 100°F exists between the center and the surface.

moment of its entrance. The value of current to the capacitors representing the outer surface of the billet must be calculated. This current is then supplied to the capacitors and will represent the heat flow from the furnace to the billet.

Measure Voltage — All such values and adjustments are made on an electrical control panel. Then—to determine the temperature distribution in the billet at any time—a probe is made of the capacitors to measure their voltage. The voltage readings obtained are recorded automatically. Multiplying these values by a scale factor converts them to temperature.

Since heat flow from the right and left sides of the billet is identical, only one side is plotted. The hearth area on which the billet rests is also plotted.

Both hearth and billet areas are then divided into smaller blocks or segments. Each block has its own electrical counterpart. It is represented by a capacitor to which a suitable resistance has been linked. This block arrangement makes it easy to spot check the temperature in all portions of the billet.

For a better understanding of the electrical arrangement, study the accompanying sketch. It spells out the relation of each electrical component to a segment of the billet.

Heating Curves—With the electrical circuitry in order, it is a simple matter to plot temperatures at various points in the billet. Every temperature reading made is related to elapsed time of heating. When a number of readings are made throughout the billet at a given time, the collected data can be plotted as a series of isothermal curves. These tell the detailed story of temperature distribution in the billet as a function of time.

Judging from the isothermal curves derived from a sample billet, surface temperature alone can be very misleading. After 4 minutes in a furnace at 2450°F, for example, temperature differential from the surface of the billet to its core is 900°F. Even after 22 minutes, a difference of more than 100°F still exists.

Valuable Tool—Obviously, this kind of information would be of tremendous value in forging. It would accurately determine the time needed for a billet to come to a uniform temperature. Also, it would spell out whatever additional soaking time might be needed to compensate for "cold" spots.

The billet-heating experiment was run by G. W. Hosfeld and

C. L. Feng, Selas engineers responsible for the design and development of the new simulator. "We started our tests with an ingot only because it represents a typical application. Also, it involves what we call a 'two dimensional' heating problem.

"The same general principles can be applied just as well to problems in heat treating, the melting and freezing of metals — or even hydraulic and fluid processes.

Still Feasible — "If we were to plot the internal temperature distribution in a steel cube, a sphere, or a more complicated shape, we would have to use a three-dimensional simulation. This is a little more complicated, but still feasible."

Thermolog, according to the engineers, is still in its early stages of growth. Its potential in either production or research is virtually unlimited. For it not only saves time in solving tough heat transfer problems. In many cases, it provides the only possible method of complete solution.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Alloy Trims Open-Hearth Costs

A high-silicon refined chrome is attracting the attention of open-hearth operators.

It cuts costs on alloy heats and yields higher chromium recoveries.

• Open-hearth operators can now cut their chromium and silicon costs with a new high-silicon, high-carbon ferrochrome. Produced by Union Carbide Metals Co., a division of Union Carbide Corp., the new alloy combines a low-cost source of chromium along with 11 pct silicon for use in blocking.

The new material is known as a high-silicon refined chrome. With every 1 pct of chromium added, it introduces about 0.25 pct silicon. A number of operators have modified their melting practices to make use of this silicon in the block. Priced at 26.5¢ per lb of chromium,

the material is a relatively cheap source of alloy.

Switch to Save—Some operators have realized substantial savings by switching to furnace additions of the new material from practices using exothermic ferrochrome in the ladle. Compared to exothermic practices, calculations for 4100 and 5100 series steels show savings of about \$1 per ton.

These savings reflect both the lower cost of chromium and the silicon addition which eliminates the need for extra blocking materials. Chrome content of these steels ranges from 0.80 to 1.05 pct.

Reports indicate that the new alloy is able to meet required chromium specifications consistently. This is particularly significant since the control of chromium analysis is generally more difficult in the furnace than in the ladle.

Higher Recoveries—In addition to holding off-grade heats to a minimum, chromium oxidation is minimized by the silicon. Higher and more uniform chromium recoveries—up to 90 pct—have been reported.

When used for blocking, the alloy gives tight blocks for the full time required with no phosphorus reversion. The new chrome penetrates the slag and goes into solution readily.

Producers who use a "light block" (0.10-0.12 pct Si) can get maximum economies by splitting their chromium addition between high- and low-silicon alloys. An addition of 0.50 pct Cr as high-silicon refined chrome will provide all the silicon needed for blocking. The balance of the chromium can then be added to the furnace as low-silicon refined chrome or to the ladle as exothermic ferrochrome.



CHARGING: A new high-silicon refined chrome, being charged into the openhearth furnace, provides an

alloy source at low cost. In addition, it yields as much as 11 pct silicon for blocking.

Need Low-Cobalt Stainless For Nuclear Applications

By W. L. Fleischmann—Consulting Engineer, Knolls Atomic Power Laboratory, (U.S.A.E.C.), General Electric Co., Schenectady

With the rise of nuclear applications in industry, more attention will have to be paid to trace cobalt contents in commercial steels—especially stainless.

Here is a rundown of the problems involved and the solutions offered by careful selection of materials.

• The ideal stainless steel for atomic energy applications would have no cobalt at all. Even the slightest trace impurities of this element would be strained from the end product. This would be the ideal condition, but it isn't realistic.

Unfortunately, some cobalt shows up as an impurity in virtually all commercial stainless. It poses a serious problem in atomic energy applications because it creates radioactive isotopes in both the fissionable fuel and in non-fissionable matter exposed to irradiation.

Most elements have radioactive isotopes or nuclides created by neutron capture. Some newly formed nuclides have a short half life with weak irradiations. Others can last for many years emitting strong gamma radiations. Cobalt belongs to this latter group.

Dangerous Isotope — With an atomic number of 27, it has a variety of isotopes ranging from mass number 55 to mass number 61. The nuclides of concern are transmutations of cobalt with the mass number of 59 (Co^{59}) to the radioactive isotope with a mass number of 60 (Co^{60}).

Co⁵⁹ is the abundant isotope and is prone to capturing an extra neu-

tron. Because of its large cross-section, cobalt atoms in the radiation zone have a good chance to become radioactive. Radioactive cobalt atoms (Co⁶⁰) decrease their radioactive emission by one-half every 5.2 years. So that when radioactive cobalt atoms are present in a system, they create a serious problem in plant accessibility.

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Harms Coolants—Because of its peculiar properties, nuclear power plants are anxious to reduce the cobalt content of alloys in contact with the reactor coolant. This coolant serves as the vehicle that carries cobalt in the form of corrosion products through the system.

To improve accessibility after shutdown, a reduction of cobalt in the materials in contact with the primary coolant is necessary. Certainly, the stainless steels which form the pressure - vessel walls should contain a minimum of cobalt. Still, it is a matter of engineering judgment to decide on a level of cobalt to give optimum results.

New Series—It is normal ASTM practice to include cobalt in total nickel content in material specifications. A departure from this practice began with the MIL-Radioactive System Series. Here the specification limit for cobalt was set at 0.20 pct max. No great effort is needed to maintain this limit with available raw materials and scrap.

A check of cobalt content in 110 different heats of steel showed that contained cobalt ran from 0.02 to 0.10 pct. Only five heats had a cobalt content of 0.4 pct.

The results of a more recent

AISI Type	Cebalt, Pet	AISI Type	Cobalt, Pc
301	0.006	3008	0.21
	0.030	310	0.32
302	0.19	316	0.15
	0.000		0.12
	0.060		0.08
304	0.14	316L	0.20
	0.000		0.17
	0.000		0.14
	0.045	321	0.24
304L	0.13	347	0.09
	0.06		0.00
	0.00		0.00

survey of cobalt content in stainless grades are shown in Table 1. Only austenitic grades were checked. In some cases, cobalt content ran above 0.20 pct. In most cases, it was considerably below this level.

Spot Checks—Another survey of Types 302, 304, and 304L found that in 55 heats cobalt ranged from 0.03 to 0.18 pct. The 304L heats had the lowest cobalt values (0.03-0.06 pct). Four heats of Type 347 boiler tube made to an MIL specification had cobalt contents of 0.09, 0.076, 0.06, and 0.048 pct.

Judging from these results, many commercially produced heats can have a low cobalt content. Keeping cobalt down is simply a matter of selecting raw materials carefully.

How do the various metals and ferro-alloys used in making stainless contribute to cobalt content? The cobalt in pig iron is generally low—about 0.01 pct. This may vary because of residuals found in different ores. Armco iron, though not normally checked for cobalt, also has a very low cobalt content (about 0.007 pct). The general average for electrolytic iron is about the same.

Safe Levels — Based on spot checks, carbon and low-alloy steels are not usually high in cobalt. Manganese-molybdenum forgings averaged 0.015 pct. Thirteen heats of carbon steel ranged from 0.002 to 0.012 pct cobalt. Even nickel alloy steels did not exceed 0.03 pct in the tests made.

A wide choice of types of nickel is available to stainless producers. Custom smelter pig may contain anywhere from 0.20 to 1.50 pct cobalt. Ferro-nickel pig ranges from 0.60 to 0.75 pct. Both sources are high in cobalt and unsultable for nuclear applications. Cuban nickel from the Nicaro mines is in the same class, containing from 0.75 to 0.85 pct cobalt.

Canadian Grades—For a low cobalt stainless, it is necessary to use electrolytic nickel, powder bri-

Гегто-Айоу	Cobalt, Pet
High-Carbon Ferrechrome Charge Chrome (Regular & Refined) Low-Chromium High-Carbon Ferrochrome Simplex Ferrochrome Nos. 1 and 2 Low-Carbon Ferrochrome (All Grades)	0.04 - 0.08
	0.006 - 0.01
Forreelileon 50 pct	0.01*
Ferroeilloen 78 pot	0.005°
Ferrochromo-Silicon	0.03*
Ferremanganese-Silicen	0.01*
Ferrotitanium	0.01°
Ferrocolumbium	0.04 - 0.06
Ferrotentalum-Columbium	0.04 - 0.10



VACUUM: The versatility of vacuum equipment is useful in carefully controlling stainless melt chemistry and eliminating impurities.

quettes, or oxide sinter. Canadian sources produce about 325 million pounds of high-purity nickel annually. Normally, this material will contain about 0.12 pct cobalt. But by careful selection, cobalt contents of less than 0.01 can be obtained from these sources.

Mond nickel contains the lowest amount of cobalt—less than 0.001 pct. The average cobalt contents found in other ferro-alloys used in the making of stainless are listed in Table 2.

Be Practical—What are the practical limits of cobalt content in stainless steels? In steels produced from regular raw materials, a cobalt limit of not more than 0.05 pct can be maintained by using pig iron or steel, low cobalt ferrochrome and nickel products, and no scrap except mill remelt. Even cobalt of less than 0.01 pct is feasible.

How to Judge the Quality Of Aluminum Hard Coatings

By Ellis P. Owens-Senior Engineer, Guided Missile Div., Firestone Tire & Rubber Co., Los Angeles

Hard anodized coatings for aluminum have many industrial uses—so long as coating quality is up to snuff.

What valid methods can be used to check coating quality?

The past five years have seen a steady increase in the use of aluminum hard coating on production parts. Along with this trend came advancements in equipment and processing. Perhaps the only facet overlooked was the development of simple methods for determining the suitability of a coating for its particular application.

At the request of Army Ordnance, the problem was tackled by Firestone's Guided Missile Div., Los Angeles. It required the review of old methods and the development of new methods to test hard coatings. The program's main objective was to prepare a specification that was both workable and a guarantee of coating quality.

Positive Tests — Probably the most crucial problem was to decide upon a test method that would give quick and positive results. In all, eleven test methods were reviewed —including continuity of coating, metallographic examination, wheel abrasion, and dielectric strength.

But major emphasis was placed on wear resistance. This is the property for which the coating is most generally used.

All tests were applied to samples coated by three common processes. One process (Sanford) uses sulphuric acid and a proprietary organic additive. It provides an

electrolyte that distributes current flow uniformly and permits coating difficult alloys and shapes.

Coating Processes — A second process uses sulphuric acid in combination with another acid such as oxalic or carbonic. The additional acid produces different and improved crystal sizes and reduces the solvent action of the electrolyte. Solution agitation and a sufficiently low temperature are essential.

The third process (Hardas) uses sulphuric acid and superimposed alternating current. It permits the initial formation of the coating with less chance of excessive solvent action. In these tests, 60-cycle ac was used. Alloys 2024 and 6061 were so treated because their electrical characteristics differ in

applying hard anodized coatings.

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Regardless of coating method, the final coating must be continuous. Any breaks may result in base-metal attack. Under high loads, the presence of pits results in spalling. Also, dielectric strength is destroyed by discontinuities.

Tests in Salt—Tests of coating continuity were made by short-time exposure to salt fog. These tests were not aimed at proving the corrosion resistance of aluminum hard coatings. They were intended to evaluate freedom from voids throughout the coatings. Exposure time in salt fog was 96 hours.

In the line of other test techniques, metallographic examination with a light microscope cannot be used to study the structure of hard coatings.



ABRASIVE TESTING: A Taber abraser (left) and Dermitron thickness tester (upper center) are used to check properties of hard coatings.

Abrasive wheel testing tends to give erratic results. A modified procedure measuring weight loss due to abrasion at a fraction of the cycles required for failure can be used. Jet abrasion is both rapid and quantitative. It probably could be used if the flow rate of the abrasive could be controlled.

Practical Approach—Indentation is the most practical test method after its proper use is determined. Indentations are made with a portable microhardness tester and a Knoop braille. The less amorphous and more crystalline the structure, the smaller are the indentations. Wear is inversely proportional to size of indentation. The method can test parts of all sizes.

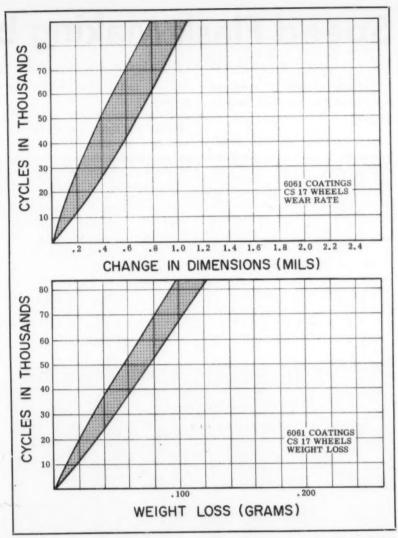
Cutting methods such as steel wool, scraping, and filing are inconclusive. Low wear resistance coatings will fail with these methods. But coatings which cannot be cut with metal were found to have a wide variation in abrasion resistance when tested by other methods.

Testing dielectric strength was used to determine the suitability of operating procedure. The dielectric strength of anodic coatings is dependent on a thin, solid layer at the metal interface. The thickness of this layer is controlled by the solvent action of the electrolyte. This, in turn, is controlled by the operating procedure.

Use Dielectric — If dielectric strength is low, the surface layer will have decomposed in the same solvent action that caused the interface layer to be thin. Wear resistance will be low.

Although density was determined, it was not related to wear resistance. True density could not be determined. This resulted from the fact that porosity volume in the coating was not evaluated.

Sceleroscope hardness measurements were made. Like Rockwell or Brinell tests, this method depends on severe deformation. It serves to measure the hardness of



RESULTS: Changes in dimension and weight loss are shown for 6061 coatings. These were abraded with CS-17 wheels, using 1000-g loads.

the base metal only. The coating offers little resistance to deformation.

Most Suitable—In all, four tests were found suitable for checking the properties of aluminum hard coatings: continuity, modified wheel abrasion, dielectric strength, and indentation.

With these tools at hand, the following standards could be set up for testing samples with a 0.001-in. coating. They apply to all three coating processes.

1) The coating must not pit when subjected to 96-hour salt spray.

2) Metal loss must not exceed 40 mg for copper-bearing alloys. It must not go about 20 mg for all other alloys when subjected to 10,000 cycles on a Taber abraser, using a CS-17 wheel, 1000-g load, and 70 rpm.

3) In dielectric strength, samples must not fall below 1200 v for copper-bearing alloys, 800 v for all other alloys.

4) Samples must withstand Knoop indentation using a 500-g load, as follows: The length of the major diagonal must not exceed 150 microns for copper-bearing alloys, 130 microns for all other alloys.

Speed Flask Making by Welding

Welding makes it easy to build steel foundry flasks in odd shapes.

In the heavy sections, semiautomatic arc welding cuts fabricating time.

Arc welding of properly engineered sections results in foundry flasks of maximum strength, long life and light weight. These improvements are accompanied by reduced costs.

Shapes that would involve difficult or impossible coring, if east, present no problem in welded construction. Reinforcement provides strength and rigidity where it's needed.

Where stresses are moderate, sections are light. But where it's necessary to have stiffness and shock resistance, heavier plate and bar-stock components join to achieve any desired result.

Stress Equipment — High speed keeps distortion and warpage in deep penetrating welds at a low level. It's achieved by using the semiautomatic submerged arc process called "Squirt" welding, developed by Lincoln Electric Co., Cleveland.

For example, the process helps Foundry Flask and Equipment Co.,

Northville, Mich., get close control over wall thickness and finish. The flask is assembled and held in a tacking fixture. Its several flamecut V-grooves are filled with weld metal.

Components joined by welding include walls, sand rails, braces and internal barring. They are fitted, clamped and tack welded with Jetweld LH-70, E-7018 electrodes of 3/16-in. size.

How to Butt Weld—The grooves in butt joints of heavy sections allow the operator to obtain complete weld penetration. By using this butt preparation, strength of the welded joint easily exceeds that of the base metal.

Travel speed is just fast enough to keep molten flux rising just above the top face of the rail. When nearing the end of the groove, the gun is tilted slightly toward the dam with the electrode held close to the dam until profuse flux bubbling occurs. The arc is then broken, leaving the weld metal flush with the top of the rail.

Only one pass is needed to fill a groove 9 in. long, 34 in. wide at the top and 34 in. deep.

Overall Time Savings — Hand welding a groove of this size and length formerly took seven passes and an average time of 3½ minutes. With the semiautomatic unit, however, the time on the same groove averages only 55 seconds.

Weld quality is another factor. A current of 425 amp applied to a small electrode diameter results in higher penetration, while depositing 0.25 lb of weld metal per minute with a duty cycle of 100 pct.

With manual arc welding, deposition would be only 0.13 pound weld metal per minute even with iron powder electrodes of the E-6024 type. The hand welding duty cycle would be about 50 pct to allow for slag cleaning and air blowout between passes.



WELD IN ONE PASS: Operator fills joint at heavy section with deep penetrating weld in one pass. Resulting quality weld is flush and smooth.

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You Arbitrate It!

TRIAL BY JURY

From the files of The American Arbitration Association

• When William C., a steel mill crane operator, went on jury duty he got a 2-week leave. Confident that he would be completely protected under a "jury duty" union agreement clause, he started on a Monday. The court excused him on Thursday afternoon of the second week. This made it possible to return to work a day early—on Friday.

William didn't know it then, but later he found that during his last day of jury service the company

"You Arbitrate It!" appears in the second issue of The IRON AGE each month. Look for it in the March 12 issue.

posted an overtime notice for Saturday; men who wanted to work were asked to sign up. As a result, William wasn't called to work Saturday.

At the same time, management marked the overtime roster to show he passed up an overtime opportunity. This deprived him of preferential treatment next, time extra hours were available.

"Glad To Work"—So he filed a grievance. "You could have notified me about the overtime," William said. "I would have been glad to work. Now you owe me back pay for Saturday, and besides, I ought to get first crack at the next overtime assignment."

Management balked; it had followed established procedures in every respect. "We posted the overtime and assigned the work to men who signed up in accordance with their positions on the overtime roster. We never notify absent employees about overtime and it doesn't make any difference what the reason was for the absence."

The case went to arbitration.
How would you rule?

The Arbitrator Ruled:

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Considering both the contract and past practice, he found the company had no obligation to contact absent employees to offer overtime. So William's Saturday pay was out. But he added: management had no right to credit any "overtime opportunity" depriving William of preferential treatment next time around. He ordered William be put at the top of the next list for extra work.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.



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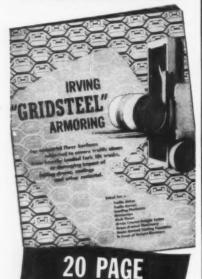
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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Saw Blades

A 31-page saw-blade handbook presents guides for getting high cutting performance and long blade life. It shows how to select proper blade, correct feed, speed and tension. (Ladish Co.)

For free copy circle No. 21 on postcard

Heat-resist Alloy

A 6-page file folder presents not previously available data on a heat-resisting alloy. It reviews chemical composition, stress rupture properties, short time high temperature properties, oxidation resistance and recommended design stresses. (Rolled Alloys, Inc.)

For free copy circle No. 22 on postcard

Precision Tools

Late developments in a company's line of precision tools appear in a bulletin. Items include: micrometers, height gages, tool setting gages, edge finders, radius gages, sine plates, dial snap and bore gages, permanent magnet chucks and precision ground tool steel. (Brown & Sharpe Mfg. Co.)

For free copy circle No. 23 on postcard

Nickel Alloy

Stress corrosion cracking, says a 12-page booklet, is brought under control by a nickel-base alloy. It describes the alloy. (Haynes Stellite Co.)

For free copy circle No. 24 on postcard

Welded Assemblies

Quick reference to welded assemblies that one firm can produce is provided by a 60-page catalog. It lists 94 materials the company welds and fabricates on a production basis. (American Welding & Mfg. Co.)

For free copy circle No. 25 on postcard

Driller-Tapper

Showing turret-type drilling, tapping and boring machines is a 4-page bulletin. Units include: hand-run, radial type, automatic hydraulic, numerically tape-run and special turret machines. Capacities: 1/4 to 11/2 in. in steel. (Burg Tool Mfg, Co.)

For free copy circle No. 26 on postcard

Numerical Control

Machine tool control systems are presented in an 8-page brochure. Controls regulate automatic point positioning and contouring. Systems are simple to program and work, economical, versatile, accurate. (Stromberg-Carlson Div., General Dynamics Corp.)

For free copy circle No. 27 on postcard

Lubrication

Lubricant application equipment, fittings and accessories appear in a 32-page catalog. Listed items apply to any machine that has a bearing surface (rotating, sliding or reciprocating) which requires a lubricant. (Lincoln Engineering Co.)

For free copy circle No. 28 on postcard

Tool-Die Steel

A cold-work alloy tool and die steel is introduced in a 12-page brochure. This material boasts: high hardenability, heat treating from low temperatures, low distortion, and easy machinability. (Universal-Cyclops Steel Corp.)

For free copy circle No. 29 on postcard

Vinyl Coatings

Strippable vinyl coatings for metals are presented in a folder. Coatings are transparent and flexible. The material protects and moisture-seals aluminum, stainless steel, copper, brass, bronze, alloys and plated surfaces, green or wet plaster molds, mockups, splashes, Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 2/12/59

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FREE LITERATURE

casts, finished and semi-finished parts of metal, wood and plastic. (Pennsalt Chemicals Corp.)

For free copy circle No. 30 on postcard

Drip-proof Motor

New drip - proof "pancake" motors reduce motor length up to 54 pct over standard motors. A 4-page bulletin describes the flangetype motors of conventional radial air-gap design. They have uses on machine tools, roof-ventilating fans and other space-cramped applications. (The Louis Allis Co.)

For free copy circle No. 31 on postcard

Recorder Controls

Temperature indicators, controllers and transmitters are featured in five specification sheets. These units have corrosion-proof glass fiber cases. They handle -400 to +1000°F. (Fischer & Porter Co.)

For free copy circle No. 32 on postcard

Aluminum Fence

Aluminum's role in the chainfence market is discussed in a 12page booklet. (Aluminum Co. of America).

For free copy circle No. 33 on postcard

Thermowells

Considering more than 325 temperature measuring setups, a 4-page guide tells how to pick the best thermowell material for a particular job. It considers: temperature, contamination, electrolysis, catalytic reaction, etc. (Thermo Electric Co., Inc.)

For free copy circle No. 34 on postcard

Dew Point Control

Automatic dew point recorders and controllers are featured in a 6-page folder. (Surface Combustion Corp.)

For free copy circle No. 35 on postcard

Metal Cleaning

How to clean and phosphate metals in one operation at low cost is told in a 16-page manual. It gives whats, whys, wheres and hows of a steam cleaner phosphating process. (Malsbary Mfg. Co.)

For free copy circle No. 36 on postcard

Gloves

Coated industrial gloves wear 20 pct longer, a 16-page brochure says. It shows many types and sizes, neoprene coated (heavy-duty), neoprene coated, rubber coated, and plastic coated gloves. Also shown are heavy-duty gloves with reinforced vinyl plastic coating and a superflexible glove. Free glove test is offered. (Edmont Mfg. Co.)

For free copy circle No. 37 on postcard

Electric Hoists

Large capacity and high speed hoists are outlined in a bulletin. Capacities run 1/8 to 2 tons. (Chisholm-Moore Hoist Div.)

For free copy circle No. 38 on postcard

Stainless Pipe

Low carbon stainless steel welded tube and pipe is covered in an 8page bulletin. Also covered are: drawn tubing, ornamental tubing and refinery-grade welded tube. (Union Steel Corp.)

For free copy circle No. 39 on postcard

Nibbler Attachment

Fit a new attachment on a Fenway portable electric nibbler and it'll cut perfect circles in 11-gage stainless sheet. A 15-in. circle takes 4½ minutes, including make-ready. Details appear in a 6-page brochure. (Pensco Products).

For free copy circle No. 40 on postcard

Coated Steel Tube

A 6-page folder tells how some designers use coated steel tubing. (Armco Steel Corp.)

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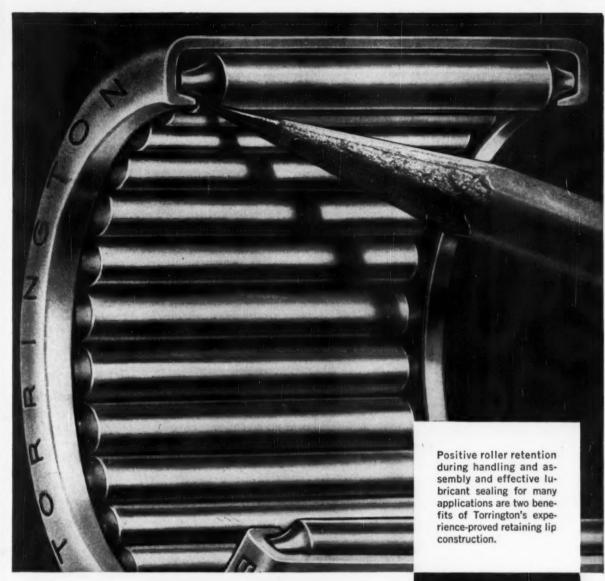
"Building" Aluminum

Architectural aluminum is analyzed in a 12-page brochure. It lists properties and uses of aluminum alloy building components and materials. (Metals Div., Olin Mathieson Chemical Corp.)

For free copy circle No. 42 on postcard

THE IRON AGE, February 12, 1959

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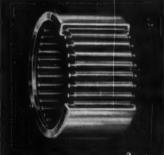


This little lip makes a big difference!

The turned-in lip at each end of Torrington Needle Bearings positively retains the trunnion - end rollers and makes the bearing truly a complete unit, with no possibility of roller fall-out.

This unit construction simplifies installation and servicing. The closely controlled clearance and the large area between cup lips and shaft form an effective labyrinth seal. Also this retaining lip allows pregreasing the bearing with the proper lubricant for each application.

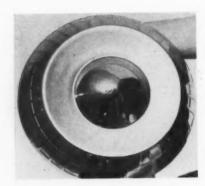
Long experience with the Torrington Needle Bearing in thousands of applications has proved the merit of this and other features in efficient performance and long service life. Make sure your product benefits from the best that experience has to offer—specify Torrington Needle Bearings. The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.



TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

New Materials and Components



Process Gives Stainless A Frosty Appearance

Stainless steel with a frosty look results from a new "semiblasting" process. Put on very lightly, it doesn't penetrate the metal's surface. Once on, its many tiny mounds diffuse light rays; hence the frosty appearance. Put on after forming operations, the process handles many kinds of patterns, lettering, bossed, deposed, flat or contoured surfaces. Using Allegheny

Ludlum Steel Corp's Type 430, its developer now produces automotive trim with the finish. Moreover, it says it can finish any size, shape, type or gage of a shiny surface of stainless. Other potential uses: h o m e appliances, architectural, furniture, toys, cooking utensils. It resists heat, cold, weathering. (Stamping Service, Inc.)

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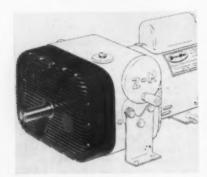
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For more data circle No. 66 on postcard, p. 119

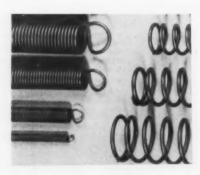


Gearheads Boost Range of Motor Transmissions

For use with a company's transmission for fractional horsepower motors, new gearheads boost speed range or torque up to 4½ times. The two-stop gearheads up the infinitely - variable transmission's speed range from 0-400 to 0-2000 rpm. They raise the torque limit from 100 to 450 in.-lb. The transmission features direct power link-

age through cams and overriding clutches. Merely moving a lever and turning a screw instantly alters speed, whether the motor is running or not. Gearheads come in eight ratios including 2, 3, 4, or 5 to 1 and 1 to 2, 3, 4, or 5. Gearheads become an integral part of the unit. (Revco, Inc.)

For more data circle No. 67 on postcard, p. 119



Producer Offers Standard Engineered Springs

Large users of springs long have enjoyed the benefits of standard spring designs, both from engineering and procurement standpoints. Now a major producer is offering standardized precision springs to anyone, bringing these advantages to medium and small users. It has studied and correlated sizes and capacities of springs

needed to meet various space limitations in common applications. They're also correlated with standard wire sizes and commonly used drill-hole sizes. In all, it has some 500 separate sizes of compression and extension springs in the standard engineered line. (Associated Spring Corp.)

For more data circle No. 68 on postcard, p. 119



Safety Thermostat Serves In Hazardous Areas

Explosion proof, this Underwriters Laboratories approved thermostat serves effectively in Class 1, Group D hazardous areas. It's designed for convenient immersion in tanks, wall installation, and for exposure to contaminated environments. Three main components are: (1) a thermo switch unit; (2) a stainless steel well; (3) an explosion-proof junction box. The latter completely protects the lead wire Pay less for more strength! Tenzaloy the self-aging aluminum alloy needs no heat treatment! If your aluminum castings are too large or too intricate for heat treatment, if your heat treating facilities are limited, if you need superior strength than you get from ordinary heat-treated alloy demand "Federated Tenzaloy" developed by Federated to meet the need for a superior aluminum alloy that ages at room temperature. Tenzaloy eliminates rejects due to warpage, expansion, and internal stresses caused by quenching. Tenzaloy finished properties are stable, proved by conclusive test data over a ten year period. No special foundry techniques are required. No fluxes. Castability is excellent with sand cast and plaster molds and many permanent molds. Tenzaloy will not "grow," produces corrosion-resistant castings with excellent polishing characteristics and anodizes clear white. Write for Tenzaloy Bulletin No. 103. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

FEDERATED METALS DIVISION OF



TENZALOY is one of a complete series of Federated aluminum casting alloys. A new plant in Alton, Ill. will soon be in production to satisfy the requirements for Tenzaloy in the mid-west.



For information and samples, send coupon

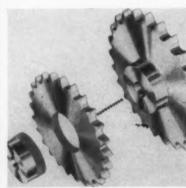
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DESIGN DIGEST

outlets. It adjusts over a 32° to 500 °F range. Rating is 10 amps 115 vac, 5 amp 230 vac. (Fenwal, Inc.) For more data circle No. 69 on postcard, p. 119

Chain Sprockets

Thanks to a new stock sprocket assembly, more rapid off-the-shelf service is available to roller chain sprocket users. The new sprockets provide a complete line of more than 600 possible pitch, teeth and bore size combinations for better, faster service to customers. Yet they reduce the distributors' inven-



tory items by two-thirds for the range of sprockets previously required. The unusual sprockets let the distributor fill his orders by assembling interchangeable plates and hubs. They combine to provide a complete line of finished bore sprockets with a minimum inventory of sprockets. (Whitney Chain Co.)

For more data circle No. 70 on postcard, p. 119

Zinc Rich Paint

Rich in zinc, a new paint contains 92 to 95 pct metallic zinc in the dry film. It gives protection somewhat like hot-dip galvanizing. The paint applies over wet surfaces. (Bart Mfg. Co.)

For more data circle No. 71 on postcard, p. 119

Electrode

For tough, wear-resistant hard surfaces and strong, ductile welds, a low-hydrogen nickel-maganese acdc electrode joins or wear-surfaces austenitic manganese and carbon steels. As welded properties include: Yield strength, 58,000 psi; tensile strength, 125,000 psi; elongation in 2 in., 50 pct; hardness as deposited, 18 to 22 Rockwell C; hardness after work hardening, 44 to 50 Rockwell C. Electrodes come in 1/8, 5/32, 3/16 and 1/4-in core sizes. (All-State Welding Alloys Co.)

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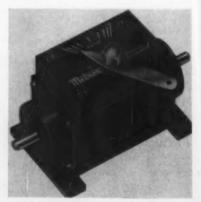
For more data circle No. 72 on postcard, p. 119

Aluminum Pipe

Seamless, one - piece aluminum pipe combines thin walls with standard thickness at pipe ends. The resulting weight reduction lowers costs. At the same time, the variable wall principle strengthens joints, usually the weakest link in piping. The pipe adapts to all joining methods, but chief advantages are with welded joints. By decreasing wall thickness of weldable, heat treated alloys, except at the joints where welding heat lowers strength. you can achieve a 40 pct weight saving. (Aluminum Co. of America.) For more data circle No. 73 on postcard, p. 119

Speed Changer

High accuracy, good repeatability and long life are reported for this miniature adjustable ratio speed changer. With an all-aluminum black anodized housing, the unit has a long, easy-to-read scale. It comes with either servo or foot mounts. Foot mounts rotate 90° in either direction. Over-all length of the



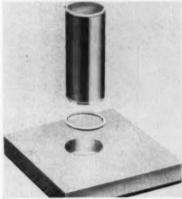
housing is 2% in. Stainless steel input and output shafts (3/16-in. diam) run in double heavy - duty shielded ball bearings. The toroidal disc drive is 52100 ball bearing

steel. Moving parts are lubricated with MIL-G-3278 grease (Metron Instrument Co.)

For more data circle No. 74 on postcard, p. 119

Brazing Materials

Brazing materials, pre-formed and formulated to meet customer requirements, are available. They offer high-temperature assemblers an economical, yet highly uniform method of achieving fine quality alloying welds, with no fluxing. Preformed materials reduce brazing from a specialized art to a manual skill, permitting highly efficient hand



assembly methods or complete assembly automation. The pre-formed piece is delivered to the assembler in the exact form and formulation to meet his mechanical and metallurgical needs. Special assembly techniques are unnecessary. Pieces are prepared according to usual good brazing procedures; the preform is placed in brazing position; the assembly is submitted to prescribed temperatures in a controlled atmosphere furnace. Finished weld is flash-free, of high strength and clean appearance. (Mansol Ceramics Co.) For more data circle No. 75 on postcard, p. 119

Generator Overdrive

With a new automotive generator overdrive system, you can have peak generator performance and constant battery charge even at curb idle with all accessories operating. The overdrive instantly increases generator rotation when the engine is idling or running at low speed. As engine speed increases, it automatically returns the generator to normal operating rate. It





Safe, Heavy Duty Performance

- · Lowest Headroom
- Push Button Control
- Fully Enclosed Components
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- Ultra-Modern Electric
 Braking
- CM-ALLOY Flexible Link Chain
- Minimum-Maintenance Operation
- · Lifetime Lubrication



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Columbus McKinnon Chain Corporation TONAWANDA, N. Y.

NEW YORK . CHICAGO . CLEVELAND

In Canada: McKinnon Columbus Chain Ltd., St. Catharines, Ont.

DESIGN DIGEST

works on fork-lift units, delivery vehicles, automobiles, etc. In a typical test, the unit was hooked-up to a generator. With engine idling the battery power indicator was checked. It showed no discharge. Then, the driver turned on headlights, radiotelephone, radio and plenty more electrically-run equipment. Still the battery did not run ra to de ce

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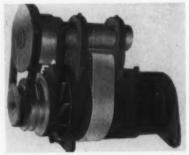
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down. The overdrive takes less than 3/4 hp to operate. It easily attaches to any automotive type generator: standard, heavy-duty or ac. No special tools or complicated mountings are needed; all components necessary for installation come with the unit. (Consolidated General Prodnets)

For more data circle No. 76 on postcard, p. 119

Phosphatizer

Phosphatizing chemicals for metal cleaning not only clean the metal surface but they also put an amorphous iron phosphate coating on ferrous metals, zinc and cadmium. They produce coating weights up to 60 milligrams per sq ft, providing a base for paint adhesion and high corrosion protection. (Cowles Chemical Co.)

For more data circle No. 77 on postcard, p. 119

Adhesive Foam

Pressure sensitive, a new polyurethane plastic foam adheres to any surface after removal of backing sheet. It's extremely light in weight with high resiliency and low compression set. Insulation properties are nearly twice that of cork. Its damping quality minimizes influence of vibration, and reduces shock and

rattle. The foam is highly resistant to temperature extremes. Sound deadening characteristics are excellent. Chemically inert, the adhesive possesses a neutral reaction. It resists corrosive attacks, fungus and mildew. And it's impervious to water, resists oils and most chemicals. It comes in varying thickness, assorted sizes and colors, and numerous die cut patterns to specifications as well as standard rolls, blocks or sheets. (Air-O-Plastik Corp.)

For more data circle No. 78 on postcard, p. 119

Cadmium Coating

A low-cost method vacuum deposits cadmium to protect hightensile steels against corrosion without danger of hydrogen embrittlement. Samples, some of which have been flexed repeatedly, successfully passed 96 hour salt spray and salt bath tests with no trace of



corrosion. In one bend test, the sub-strate failed before the coating. Chief use should be with high heat-treat steels which tend to become embrittled when electroplated. Coatings meet military specification Mil C-8837 (ASG), for aircraft parts. (NRC Equipment Corp.)
For more data circle No. 79 on postcard, p. 119

Aluminum Shingles

Aluminum roof shingles in permanent colors have been introduced. In six baked enamel colors, the shingles offer maintenance-free advantages. (Reynolds Metals Co.)

For more data circle No. 80 on postcard, p. 119

Tool Steel

Previously stocked only in flats up to 4×6 in., a tool steel now is offered in: 3×7 , $4\frac{1}{2} \times 6$, and 4×10 . The latter is half again the size



Cost reduction, achieved through the use of Edgewater steel rings, is due to savings in machining time and reduced scrap loss. Edgewater rolled rings are formed to tolerances so close that a minimum of machining is required. Weldless rings are rolled from solid steel blocks by a process which produces a wide variety of cross-section shapes. Diameters are from 5 to 145 inches.



WRITE for bulletin describing Edgewater Rings.

Edgewater Steel Company



DESIGN DIGEST

of the previous largest bar. Cobalt gives the steel its wear resistance and strength. It resists edge chipping or crumbling. The metal suits heavy - gage stamping and severelong-run applications. (Darwin & Milner, Inc.

For more data circle No. 81 on postcard, p. 119

Totalizer Unit

New load totalizers combine loads on two, three or four hydraulic load cells. The simple, self-contained totalizer units have a sensitivity of 1 part in 5000. They are impact shock resistant, weather-proof, and not affected by variations in temperature. (A. H. Emery Co.)

For more data circle No. 82 on postcard, p. 119

Metal Coating

A finish is being marketed which retards flaking and peeling of paint. It's a zinc phosphate coating which applies over a very thin deposit of electro zinc. This prevents reaction

WARD STEEL co.

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

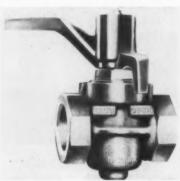
878 Rindge Ave. Ext. Phone UN 4-2460 CAMBRIDGE 40, MASS.

Branch 3042-3058 W. 51st Street, CHICAGO, IU Phone: Grovehill 6-2600 between the zinc surface and the paint finish, thereby increasing durability and quality of the painted product. It also has use as a drawing aid in certain types of metal fabrication. The phosphate coating has a great affinity for oil; it retains oil under high forming pressures. The phosphate itself takes part in the drawing and prevents scoring and galling. (Metal Coating Div., Kirsch Co.)

For more data circle No. 83 on postcard, p. 119

Vacuum Valves

Vacuum valves of a new design employ a unique eccentric principle. The plug, eccentric or camshaped in cross-section, matches an eccentrically raised body seat. Carried on journals at either end, the plug ro-



tates only a quarter-turn from full open to dead shut. The plug face and seat make contact only when the valve is closed; in opening the valve, the slightest rotation of the plug breaks the contact, and the valve action is free, easy and frictionless. Leak rate across the seat on a 3 in. valve is certified at less than 0.003 micron cu ft per hour. Certified stem leak rate on valves 3 in. and smaller is 0.01 micron cu ft per hour. Valves come in semi-steel, stainless steel. Ni-resist, bronze, acid resisting bronze, steel, aluminum, alloy 20, Monel, pure nickel, Hastelloy B, Hastelloy C and other alloys. They come in sizes 1/2 thru 20 in. (De-Zurik Corp.)

For more data circle No. 84 on postcard, p. 119

Columbium Tubing

Commercial production of columbium extrusions is now reality. A major tube producer is accepting orders for extruded columbium rod and tube in: rod, ½ to 1-in. diam; tube ½ to 1-in. OD 0.085 to 0.020 in. wall thickness; both rod and tube, lengths up to 20 ft. (Wolverine Tube Div., Calumet & Hecla, Inc.) For more data circle No. 85 on postcard, p. 119

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Hydraulic Valves

New 3000-psi hydraulic valves are available to meet all JIC requirements. Sub-plate mounted, valves are manually controlled by a lever. Seven basic spool designs are available from ½ to 2-in. sizes. (Rivett, Inc.)

For more data circle No. 86 on postcard, p. 119

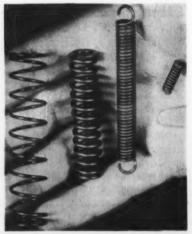
Ductile Iron Pipe

Combining corrosion resistance of cast iron with mechanical properties similar to steel is a new line of pipe, tubing, casing, fittings and special castings. Applications include: high pressure piping, high temperature piping, roll-out table rollers for steel mills, stator shells for electric motors, piston heads for hydraulic assemblies, and machine component parts. (American Cast Iron Pipe Co.)

For more data circle No. 87 on postcard, p. 119

Spring Wire

Spring wire of Inconel X operates in 650 to 1000°F heat. The wire is a heat-treatable nickel-chromium, iron, titanium material that



precipitation hardens. It's available annealed from 0.005 to 0.166-in. diam, in spring temper from 0.005 to 0.180-in. diam, and in No. 1 temper from 0.005 to 0.230-in.

diam. Spring temper serves 650 to 750°F. Corresponding tensiles range from 190,000 to 270,000 psi depending on wire diameter. No. 1 temper serves 650 to 1000°F operating temperatures. Corresponding tensiles range from 130,000 to 165,000 psi, depending on wire diameter. Finishes include copper, lead, cowles lime, lime-oil and bright. (National Standard Co.) For more data circle No. 88 on ponteard, p. 119

in 1/16-in. graduations. They meet close tolerance requirements. Of black penetrate finish steel, the shaft collars serve a wide range of manufacturer needs. (Jergens Tool Specialty Co.)

For more data circle No. 90 on postcard, p. 119

Coated Tubing

Plastic coating now minimizes paraffin deposition in tubing and casing. It's a tough, epoxy-phenolic plastic. Shot-blasted surfaces are alternately sprayed with it and baked until the lining is a predetermined thickness. After the final coat, baking at 275°F to 400°F polymerizes all coats into a hard, smooth lining. This effectively resists paraffin deposition. Nine standard sizes of plastic coated tubing and casing range from 2% to 7-in. (National Supply Co.)

For more data circle No. 91 on postcard, p. 119

Automation Bypass

For use with indicating pneumatic controllers, a new four-position control bypass lets the operator temporarily take over from automatic controls handling temperature, pressure, liquid level or other



process variables. Using it, the operator can readily cut off controller air to the valve (or damper, etc.). He then positions the valve manually. (U. S. Gauge Div., American Machine & Metals, Inc.)

For more data circle No. 89 on postcard, p. 119

Shaft Collars

5

Steel shaft collars recently introduced use special socket set screws.



The collars come in sizes to fit shafts ranging from 1/4 to 3-in. OD



ERIE BOLT & NUT CO.

Representatives in Principal Cities

Erie, Pennsylvania

New Equipment and Machinery



Surface Plates Are Accurate To Millionths

New precision granite surface plates and accessories are guaranteed for millionths of an inch accuracy. They range from small toolmakers flats to large 7 x 14-ft surface plates. Accessories include: granite layout, angle and T-slotted plates; parallels and straight edges. Surface plate stands with either leveling screws or casters also are available. Plates are of California black granite, normalized and stress relieved by nature to hold accuracy

permanently with practically no maintenance. They repel moisture, shed abrasives, resist erosion, will not warp, and are washable with soap and water. Gage dials are easy to read against the non-reflecting black plates, even in bright light. A unique lapping method assures the plates of a highly smooth surface. There are no embedded quartz particles in black granite to scratch instruments. (Pratt & Whitney Co.)



Feedback Unit Gives Press Operator All Control

A novel feedback mechanism gives the operator complete control over a new servo-run C-press. He has absolute control over all press actions without unnecessary and space-taking linkages. At the top of the press stroke, the servo is in a closed position. As the operator depresses a lever, a spiral cam connected to the ram turns the fast thread of the valve spool actuator. Slow hand motion means slow ram

movement; fast action produces rapid ram movement. Motion is positive and smooth. Bed and throat area is completely unobstructed for tooling and fixtures. This manually-run C-press is particularly suited to straightening jobs as the operator has complete control of ram speed, travel, distance and tonnage imposed on work. (Hydraulic Press Mfg. Co.)

For more data circle No. 47 on postcard, p. 119

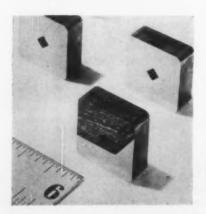
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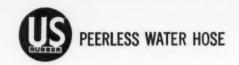


Mirror Finish Gives Cutters Long Tool Life

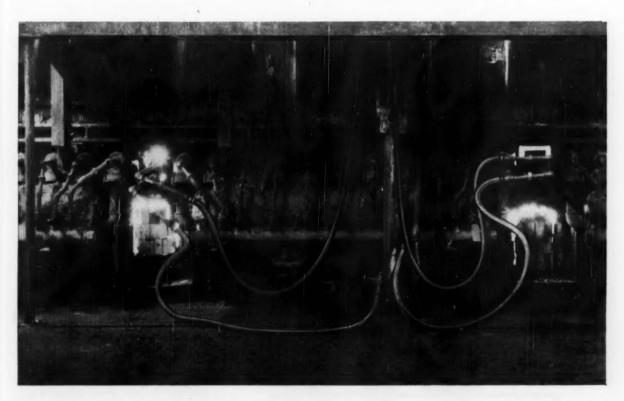
Long tool life and less chip wear result from a new mirror finish on its cemented carbide inserts, reports a producer of cutting tools. It says the inserts last about 20 pct longer. Mechanically held in special holders, the inserts are recommended for working steel or other materials. Their mirror finish reduces chip friction and cratering; this increases both tool performance and tool life. The latter is true es-

pecially in machining the more abrasive type materials. Lapping the indexible inserts with a superfine grit wheel makes the new finish possible. This finish lets cut metal slide away from the cutting edge more quickly, thus reducing cratering and chip wear. Inserts are available at no extra cost over the company's ordinary ones. (Allegheny Ludlum Steel Corp.)

For more data circle No. 48 on postcard, p. 119



BIG STEEL MILL DEPENDS on U.S. PEERLESS WATER HOSE to prevent pipe skid burn



In the Fretz-Moon furnace of this Kaiser Steel Mill in Fontana, Calif., one length of U.S. Peerless® Water Hose ("the hose with the good brown cover") carries cold water to the pipe skids, another length carries the return hot water—up to 200° F. If the hose should fail or kink, the pipe skids would burn up and costly repairs and downtime would follow.

Kaiser Steel depends on Peerless to safeguard valuable

skids and keep its pipe mill in operation. U. S. Peerless is part of the complete line of U. S. Rubber's industrial hose, engineered for use and abuse.

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NEW EQUIPMENT

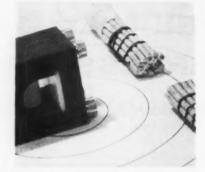
Gas Generator

Controlled generation of protective atmosphere gas using dissociated ammonia or hydrogen is possible with a new gas generator. It produces 75 to 100-pct nitrogen atmosphere, 0 to 25-pct controlled percentages of hydrogen, at minimum dew point. The generator provides atmosphere for a variety of jobs, i.e., processing electronic components, purging, curtain gas for furnaces. (C. I. Hayes, Inc.)

Cable Cutter

Basically for missile use, a propellant-actuated guillotine cutter may find other applications. It boasts a unique feature: individual conductors in the cable bundle don't short-circuit when cutting action takes place. Instead, a ceramic cut-

ter blade drives through the cable bundle onto a ceramic anvil. Driving power comes from a standard screw-in explosive cell. Potential applications include cases where



electrical circuits must be severed with no electrical contact between separate circuits. (Beckman & Whitley, Inc.)

For more data circle No. 50 on postcard, p. 119

Internal Grinder

Built for grinding bores in miniature bearing races and internal ball tracks in miniature bearing outer races is a new internal grinder. The machine is extremely compact. It requires only 8½ sq ft of floor space. Workpieces automatically load, are ground and unloaded by means of a new disk drive shoe centerless fixture. This provides interchangeable "packaged tooling" which can be set up away from the machine if desired. Bores and raceways in miniature bearing races up to 0.625-in. OD can be ground. (Bryant Chucking Grinder Co.)

Locomotive Crane

Completely automatic, this diesel locomotive crane eliminates all open gearing. It also uses no shafts, shaft

bearings or clutches; all are major

sources of maintenance. Operation is smooth and quiet. It's available in 9 sizes. (Orton Crane & Shovel Co.)
For more data circle No. 52 on postcard, p. 119

Swivel Chucks

Permanent magnetic chucks in a new line have swivel bases. They allow tilting of the chuck and workpiece to 45° right or left of center. Exact position is set directly from an integral graduated dial. (O. S. Walker Co.)

For more data circle No. 53 on postcard, p. 119

High-speed Furnace

Especially built to test components, a unique quick-heat furnace reaches 3500°F within 90 seconds. Quartz heat lamps supply the elevated temperature. By arranging 30 lamps in a circle with a copper water-jacket cooling system around





The number of different parts made from Roebling High Carbon Specialties, Flat Wire and Spring Steel are close to countless.

Some things you can count on, though, are the consistent dimensional and mechanical uniformity you get with any Roebling High Carbon Specialty. They are the qualities that contribute to speeding *your* production and cutting *your* costs.

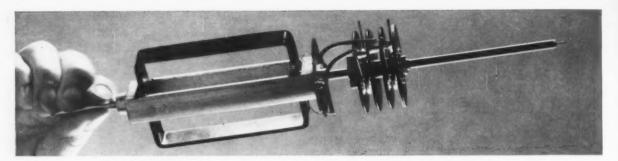
They are high qualities that make for high values. Next time you need flat wire or spring steel, specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

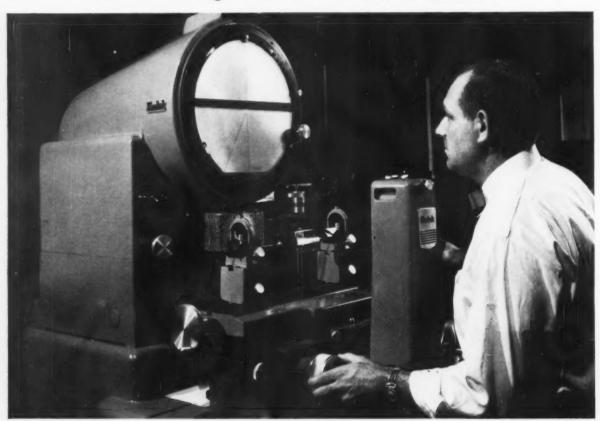
Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation



Roebling ... Your Product is Better for it



Before Westinghouse said "You can be SURE"...



they checked <u>concentricity</u> with this Kodak Contour Projector

What you see above is the moving element used in Westinghouse Type 44 electrical recording instruments.

Exact clearance between this element and the stationary elements is essential since these instruments often must be used in extreme temperature zones. This, along with the accumulation of tolerances in the complete assembly means that control of *concentricity* is vital.

You could check using surface plate, V-blocks, and height gage with clock indicator.

But Westinghouse checked concentricity with a Kodak Contour Projector. They saved time. They saved the cost of gages. They had no worries about damaging delicate parts because a beam of light exerts no pressure. And engineers were able to make corrections before production was started.

You, too, can be sure about effective, economical inspection with a Kodak Contour Projector.

The Model 14-5, shown in use at Westinghouse, is one of 6 models. They range from a portable, bench type model with 8-inch screen to the big 30-inch screen model.

Get all the facts. Write to:

Special Products Sales

EASTMAN KODAK COMPANY, Rochester 4, N. Y. the KODAK CONTOUR PROJECTOR



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NEW EQUIPMENT

them, the standard lamps operate over twice the manufacturer's rating. Inner surface of the furnace is gold plated for better heat reflection. The cooling system prevents lamps and connectors from melting. Maximum power is jumped from 1000 to 2700-w per lamp. (Boeing Airplane Co.)

For more data circle No. 54 on postcard, p. 119

Demineralizer

Thoroughly field tested, new water de-ionizers convert raw water to extremely high purity. The de-ionizers provide less than one-half part per million total dissolved solids. They feature both a new direct reading hydroion meter and a newly designed, simplified, one handle control valve. By simply placing the handle in any of four positions (operation, back flush, rinse, or regeneration), the operator

automatically directs water flow to accomplish the desired operation. The new 18-port, leakproof, rotary valve is impervious to chemicals used. (Carma Mfg. Co.)

For more data circle No. 55 on postcard, p. 119

Thread Roller

A small precision thread rolling attachment fits No. 00 Brown & Sharpe single spindle automatics. It provides diameter capacity from 0



to 5/16 in. Maximum thread length is ½ in. The two-roll attachment is adjustable and self-compensating. Free floating, the cross slide adapter aligns thread rolls

with the work during the entire rolling cycle. (Reed Rolled Thread Die Co.)

For more data circle No. 56 on postcard, p. 119

Motor Base

Available in bases to fit all NE-MA sizes through frame 505, a reaction torque tilting motor base provides automatic belted drive tension control under changing load conditions. The base makes efficient use of space because of compact design. Engineered on the principle that action and reaction are equal but opposite, the motor base's reactive torque is directly proportional to the horsepower. The belt tension increases and decreases as the load varies. (Allis-Chalmers Mfg. Co.)

Chromium Plating

Completely automatic, a continuous chromium plating barrel has an hourly output equal to 3½ to 4 batch barrels. It needs attention only for feeding parts into it

CHAMBERSBURG



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562 Derbyshire St. (Phone: COlony 4-7151) Chambersburg, Penna.

60" Centrifugal Pump Casing Wt. 50,000 lbs.

PRECISION CASTINGS



NEW EQUIPMENT

and removal of plated parts from a tote box. A user reports that the barrel reduces inspection time and gives more uniform plating. It also cuts rejects. Dry and burnished parts go into one end and feed automatically into the plating barrel. This has specially designed baffles which assure plating without contact marks. Timing is automatic: it adjusts for plate thickness and number of parts. Capacity depends on size of parts. A typical setup plates approximately 23,000 parts per hour. (Metal & Thermit Corp.) For more data circle No. 58 on postcard, p. 119

Micrometer

For use in rolling mills etc., this micrometer measures sheet or strip metal as it rides off the rolls. The sturdy tool has a 1-in. range by thousandths. It has a plastic handle and a large winged locking screw which permits use even while wearing large protective gloves. Rugged construction lets it take rough treatment in many steel mill and other applications. A beveled spindle end

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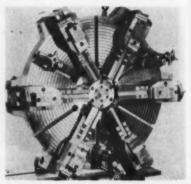


and anvil allow the "mike" to slide smoothly onto work. Winged locking screws can be placed on either side for convenience. (Brown & Sharpe Mfg. Co.)

For more data circle No. 59 on postcard, p. 119

Universal Chuck

This 30-in. diam universal chuck lets users control chucking pressure on workpieces. It features jaws which open wide for easy loading and unloading, quick set-up and changeover, with high accuracy. Custom-built, the chuck accommo-



dates gears, rounds and odd-shaped workpieces. False jaws can be made by the user to handle additional parts as necessary. Rapid-acting jaws pull the workpiece back into the chuck and against rest stops. Since chucking pressure is controlable, parts can be chucked with a feather-light touch, without distortion. The same chuck can also



DOES WORK OF BIGGER PRESSES

In a feast-or-famine market, versatile equipment pays off! That's the reason for the new 750-CS which handles smaller scrap with unbeatable efficiency and bales car bodies at a pace only slightly off that of the big expensive presses. The powerful new "Ram-Pan Loader" with the curved bottom fits the arc of the compression door as it pushes the car down into the charging box, a pre-baling operation that takes less than a minute and reduces costly cutting or shearing work. All told, you've got a tight compact bale in less than three minutes! You'll like the many other new features of the 750-CS.

Mfd. By DEMPSTER BROTHERS, Inc. WRITE TODAY FOR NEW BULLETIN ON 750-CS

DEMPSTER BROTHERS, Dept. IA-2 Knoxville 17, Tenn.

round-up parts distorted in heat treating simply by increasing chucking pressure. (Garrison Machine Works, Inc.)

For more data circle No. 60 on postcard, p. 119

Sheet Forming

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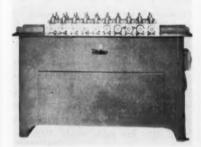
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For fabricating sheet metal pipe, this unit forms a male lock on one side, a female lock on the opposite side. It produces any diameter pipe or duct. Or it can employ roller dies to form both male and female sections of a button, snap, slip, double seam, drive cleat, Pittsburg, right angle flange or many other shapes. All roll sets are completely interchangeable. Top shafts fit into pillow block assemblies; these have easy to read micrometer



adjustments. The machine comes in two models. Both are 24-in. wide, 42-in. high, and 64-in. long. One has a 30 fpm speed with a V-belt drive. The other has 90 fpm speed with a roller chain drive. (Flagler Corp.)

For more data circle No. 61 on postcard, p. 119

Coolant Filters

Employing a vacuum method, new filters provide high flow rates in continuously filtering machine tool water soluble oil coolants. Self-cleaning, the filter makes possible high speeds, fast feeds and good finishes. It removes chips, abrasives, dirt and other solid contaminants with low coolant loss and reduced shut-down. Producing a four times greater cake than by conventional gravity flow through the paper, the unit can provide a 75-pct savings in filter paper costs. In protecting against loading it makes possible a

25 to 30-pct savings in grinding wheels, cutting tools, honing stones broaches and other individual machine tools. (U. S. Hoffman Machinery Corp.)

For more data circle No. 62 on postcard, p. 119

Buffer, Polisher

Both polishing and buffing on one machine is economically possible using this abrasive belt polishing head. For use on a company's polishing lathes, the head offers advantages of contact wheel, free belt and platen grinding and finishing. The head handles light to medium duty polishing operations. It can set up on either or both sides of the lathe. The unit takes little floor space; operator is just one step from polish to buff. Spindle speed of 1750 rpm gives 5500 sfpm using a 12-in. diam contact wheel. The upper idler pully assembly ad-



PLANT LOCATION QUIZ

Where have 3 major taxes on manufacturing industry been eliminated?

WESTern PENNsylvania. The State of Pennsylvania has exempted manufacturers from the Capital Stock and Franchise Tax, eliminated the Machinery and Equipment Tax, and repealed the Stock Transfer Tax. Add to this the fact that there is no personal State Income Tax in Pennsylvania, and you have a most favorable tax climate for your new plant.

N PITE

In addition to this favorable tax climate, WESTern PENNsylvania communities offer 100% plant financing at low interest rates; ample skilled and semiskilled workers—and will help you get them; excellent transportation facilities—including three navigable rivers for cheap bulk transport; and many other advantages.

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Company	561661

NEW EQUIPMENT

justs so belts from 52 to 90-in. long can be used. Belt width can be from

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1 to 2½ in. (Hammond Machinery Builders)

For more data circle No. 63 on postcard, p. 119

Mobile Welder

Recently developed, this mobile gun unit handles general purpose portable spot welding. It features a lightweight welded steel cart. This permits easy moving of the unit from one job to another. Welding



transformer, heat regulator, electronic controls, air controls, air valve and flexible cables with air operated gun are all mounted on the cart. (Federal Machine and Welder Co.)

For more data circle No. 64 on postcard, p. 119

Diecasting Mold

Double impression molds in a vertical position are provided by a

new die unit. Users change either or both molds in minutes from the top with eye bolts and a hoist. It eliminates handling ordinarily required in multiple impression horizontal set ups. Another advantage:



larger products can be molded. Basically, the mold is designed for zinc and aluminum diecasters who can shoot molten metal in the lower position. (Richards Tool & Mold Co.)

For more data circle No. 65 on postcard, p. 119

NEW FILMS

National Machine Tool Builders Assn. has available a 26-page booklet on 147 motion pictures. Running times are 5 to 70 minutes; 84 are color; most are 16mm, sound. NMTBA, 2071 E. 102nd St., Cleveland 6, Ohio.

"The Red Strand" presents a trip through a wire mill where rod becomes wire. Patenting, cleaning, coating, drawing and spooling scenes appear. 22½min, color, sound. Leschen Wire Rope Div., H. K. Porter Co., 2727 Hamilton Ave., St. Louis 12, Mo.

"Automotive Wheel Bearings" comes in four parts. Ball, roller and engine bearings, and oil seals, are covered from the standpoints of care and handling and replacement. 20min. each. Slide films, color, sound. Federal-Mogul-Bower Bearings, Inc., 11031 Showmaker Ave., Detroit 13, Mich.

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THE NEW STRIPPIT FLEX-O-DRILL

- \bullet Drills, reams, scribes, center punches to $\pm~0.002''$ WITHOUT base line drawing or height gauge layout!
- EASY, ACCURATE POSITIONING—quickly set to any reference point and to nearest 0.100" by adjustable steel tapes reading in both directions from zero. Micrometric gauges then bring settings to nearest 0.001". No optical scanning device needed.
- LASTING ACCURACY! Table is an actual ground surface plate.

 Bridge assembly is of heavy, accurately machined castings. Lead screws are precision ground and engaged only during micrometric gauge settings to minimize wear. All parts are corrosion-resistant. Bearings are protected against dust and chips by felt shields. Drill motor is heavy-duty industrial type.
- 1/4" CAPACITY in mild steel stock up to 24" width, any length.
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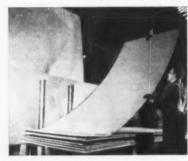
STAINLESS DIRECTORY

Buyers Guide to Ryerson Stainless Stocks & Services

Here's a quick guide to the nation's largest stocks of stainless steel—2,351 sizes, shapes, types and finishes of stainless in stock at Ryerson.

This wide selection assures you of getting the best stainless for every application. Extra care in storage, handling and shipping—such as padded shear clamps to protect finish and flatness of sheets, guards the high quality of Ryerson stainless stocks. And in addition, the help of full-time stainless specialists is yours when you call Ryerson.

See your Ryerson catalog for a complete listing of stocks and call your nearby Ryerson plant for quick shipment of stainless—any type or size—one piece or a truckload.



PLATES—Available in 9 analyses including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also low carbon types for easy welding.



SHEETS—11 analyses of Allegheny stainless sheets in stock including nickel and straight chrome types. Also extra wide sheets to reduce welding costs, expanded and perforated sheets.



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BARS AND ANGLES—Rounds, squares, flat's, hex's and angles in 8 types including free-machining bars with both analysis and mechanical properties controlled.



RIMGS AND DISCS—Machine cut to your order. This service assures size accuracy, smooth edges, flatness and unaffected corrosion resistance in a lower-cost, ready-to-use product.



HEADS—A.S.M.E. flanged and dished heads in types 304, 304L, 316 and 316L are on hand in large quantities, and in a wide range of gauges and sizes.



PIPE AND TUBING—Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also screwed type and welding fittings and Cooper stainless valves.

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Principal Products: Carbon, alloy and stainless steel — bars, structurals, plates, sheets, tubing — aluminum, industrial plastics, metalworking machinery, etc.

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The Iron Age Summary

Market Strength Is Real Thing

Steel men say strike-hedging is only part of the story behind market upsurge.

Evidence growing that steel users are buying for actual need as well as strike hedge.

• Strike-hedge buying is only part of the story behind the upsurge in steel demand. The mills report growing signs that steel-using companies are buying for actual need as well as for inventory-building in case there is a strike next summer. They say incoming orders are firm and solid.

"There are no phonies in this thing," said one steel man. "You don't have customers suddenly jumping from 100 tons to 1000 tons a month. The increases line up with past patterns on our share of the market."

Straws in the Wind—Steel men report their customers are not just issuing blanket orders for the first half or even for a given month. They want to know the week shipments will arrive. This indicates they probably need the steel to meet rising production levels in their own operations.

Another straw in the wind: Steel service centers (warehouses) in the Chicago area have started to receive some mill-sized orders for sheet and coated sheet. What apparently is happening is that some steel users are turning to warehouses when mills cannot meet deliveries.

Orders Are Screened — Many steel users who waited too long to place orders are being turned down by the mills, especially on sheet and strip. Another reason for this is that the mills are carefully screening orders, partly to take care of their regular customers and partly to see that everyone gets a fair shake.

In some cases, steel sales offices are dickering with home office management to squeeze valued accounts onto mill rolling schedules. Strength Is Contagious—For all intents and purposes, sheet capacity for the first six months has been spoken for. The mills know that what little rolling space is still available will be snapped up before too long.

Market strength in flat-rolled products is spreading to other steel items.

Bar Outlook Good—The outlook now is for bar mills to be booked to capacity by April. Wide flange beams will be sold out for the second quarter. Seamless pipe mills will go to 100 pct of capacity this month or in March. One maker of manufacturers' wire and rod is now at 80 pct of capacity, expects to hit a peak of about 90 pct. The mills expect standard pipe to hit capacity in May and June.

Merchant wire products are still weak. Standard structurals are lagging. Both light and heavy plate orders are being carefully screened in what amounts to a system of allocations.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,378	Last Week 2,293	Month Ago 2,123	Year Ago 1,445
Ingot Index				
(1947-1949=100)	148.0	142.8	132.2	90.0
Operating Rates				
Chicago	88.0	85.0*	83.0	58.0
Pittsburgh		76.5*	72.0	57.0
Philadelphia	91.0	90.0*	77.0	64.0
Valley	81.0	78.0*	59.0	41.0
West	87.5	86.0	85.0	67.5
Cleveland	85.0	85.0*	83.0	37.0
Detroit	96.0	77.0*	95.5	
Buffalo	100.0	100.0		52.0
South Ohio River	92.0		63.5	46.0
		92.0*	85.0	44.0
South	73.0	72.5	70.5	52.0
Upper Ohio River	81.0	85.0*	86.5	58.0
St. Louis	85.0	83.0*	87.5	78.0
Aggregate	84.0	81.0	75.0	53.5

*Revised

Prices At a Glance

11.50 11.50 11.50

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise	noted)			
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton) Scrap No. 1 hvy	\$66.41	\$66.41	\$66.41	\$66.42
(Gross ton)	\$43.83	\$43.83	\$40.50	\$37.33
No. 2 bundles	\$30.33	\$30.33	\$29.00	\$29.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	30.00	30.00	29.00	25.00
Lead, St. Louis	11.80	11.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.375	101.375	* 99.125	93.00

Zinc, E. St. Louis

Alloy Metal Shortages Are Over

That's the encouraging word from A. B. Wadsworth, assistant purchasing a gent, Allegheny Ludium Steel Corp.

He believes domestic metals production should be supported despite price drawbacks.

• There'll be adequate supplies of nickel, chromium, tungsten, and like metals in the next one or two years.

For the first time since before World War II, users of these alloy metals can forget about possible shortages.

This encouragement comes from A. B. Wadsworth, assistant purchasing agent, Allegheny Ludlum Steel Corp., and president of the Purchasing Agents Assn. of Pittsburgh.

Varied Needs—Mr. Wadsworth buys alloy metals as well as capital equipment for A-L. The company is a heavy user of nickel for stainless steels. A wide range of metals goes into its line of tool, electrical, and specialty steels.

This situation has brought Mr. Wadsworth up against some of the meanest purchasing problems in industry. The postwar period was marked by chronic nickel shortages.

Prices of alloy metals have reacted violently to demand buildups. Selenium jumped from \$1.90 a pound in 1947 to \$16.25 a pound in 1953. Ferrocolumbium bounced from \$2.52 a pound to \$12.03 a pound in a few years time.

Stockpiles Out — Despite this background, Mr. Wadsworth is maintaining low inventories. In the case of nickel, he feels the supply problem has at last been licked. World nickel capacity will be 650



A. B. WADSWORTH: Bargains can have drawbacks.

million pounds a year by 1961. World consumption ran around 330 million pounds last year.

Even without this indicated surplus, Mr. Wadsworth feels nickel stockpiling would be futile. In past shortages the government has based allocations on the amount of nickel a company had on hand.

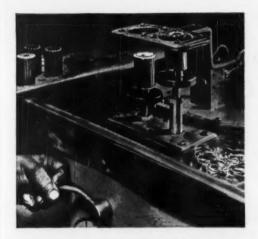
Price Traps—He does not believe in speculative buying of the long range type. The price of ferrocolumbium has dropped more than \$8 since 1953. Tungsten is down 50 pct from boom levels. Selenium and cobalt are off sharply.

On past performance, prices of these metals will bounce back as demand increases. But Mr. Wadsworth points out buyers have been burned before on long term commitments at bargain prices. This thinking was pointed up last week when the price of cobalt dropped 25¢ from a level that seemed attractive by past standards.

In general he feels a purchasing man should not jump at special deals without first taking a look at the broad picture.

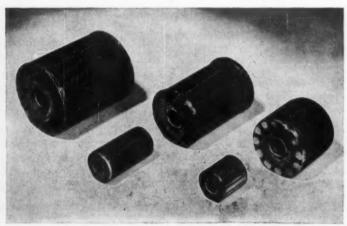
support Local Suppliers—Allegheny Ludlum is now buying much of its tungsten from a domestic producer at \$2.05 a pound. Foreign lots of the material are being offered for as little as \$1.40 a pound. However Mr. Wadsworth feels it's to his company's advantage to support domestic production in the lean period. If the domestic mining operation is forced to close down, the mill will be dependent on the volatile international market when demand rises.

A purchasing man should take into consideration the market and research support provided by a supplier, says Mr. Wadsworth.



Handy & Harman Sil-Fos Silver Brazing is Used by Induction Motors Corp. in 5427 Different Motors







FIRST, BULLETIN 20
This informative booklet will get you off to a
good start on the
values, techniques and
economies of lowtemperature silver
brazing. A copy awaits
your request.

Induction Motors Corp. of Westbury, New York, and Maywood, California, has built an outstanding reputation as a designer and manufacturer of sub-fractional horsepower motors...for 5427 high performance reasons.

This large variety of motors, blowers and fans for an equally large variety of applications, stems from 15 basic motor frame sizes, depending on length, pole materials, windings, groove angles and the like.

Handy & Harman silver alloy brazing is concerned with brazing the rotors. Each rotor (whatever the size) is joined by a preformed ring of Handy & Harman SIL-Fos, by induction heating — at an alloy cost that is reckoned in pennies. For example, the alloy cost per %" frame is two cents per joint, or four cents per complete assembly.

That's an example of the economics of silver alloy brazing. Performance requirements are quite another thing — and they are unquestionably stringent. Many of these motors are used in aircraft and missile work and must, of course, meet the most extreme environmental conditions.

Strength alone would be reason enough to

discuss the merits of silver alloy brazing... and to point out as a reason for its wide acceptance throughout industry. The facts are that there are many more benefits; gas-and leak-tightness, thermal and electrical conductivity, ductility, and production economy—are all joint qualities of silver alloy brazing. At any time, we will be happy to discuss any or all of these qualities (and others), as applied to your product or production method. The benefits are large and you can enjoy them.



Bridgeport, Connecticut • Chicago, Illinois • Cleveland, Ohio • Detroit, Michigan • El Monte (Los Angeles), California
 Dakland, California • Providence, Rhode Island • Toronto, Canada • Montreal, Canada

Order Surge Spreads To More Products

Fast buying pace has now widened to include more than sheet and strip.

There's increasing demand for plate, linepipe, seamless pipe, bar, and wire.

• Greater demand is spreading from sheet and strip to other products. Buyers are also stepping up their orders for plate, linepipe, seamless pipe, hot-rolled bar, and wire. In many cases they are interested in second quarter tonnages. But mill order books for March are also fattening out fast.

Typical of buyer comment is this remark by a West Coast warehouse sales manager: "We're putting in a little more of almost every item. We feel it's a good bet. Business should really jump after March 1."

More buying has already revived the heavy plate market. Now demand for light plate is growing. Midwest mills are setting up second quarter quotas on some grades. Light plate users in other areas who rely on strip mill plate are looking for new sources of supply. The mills, swamped with strip orders, are suspending light plate rollings.

At the moment linepipe is the most popular pipe product. East Coast mills are booked solid through the second quarter. But orders for seamless pipe and tube are also increasing. Mills which operated around 50 pct in mid-December are now reaching capacity production.

Also on the upturn: Sales of hotrolled bar. One mill doubled its order rate in a two-week period. Some producers are collecting data on the normal monthly tonnages of customers. Reason: They want to have quotas ready for the second quarter if they are needed.

Advance orders are helping wire producers. At one mill manufacturers wire deliveries have jumped from 3-4 weeks to 4-8 weeks.

More Furnaces Start Up—As the order pace quickens, mills are bringing more open hearths and blast furnaces back into production. Last week U. S. Steel relighted blast furnace No. 1 at the McKeesport Works of its National Tube Div.

Republic Steel started up two more open hearths at its Youngstown plant, announced plans to bring on another blast furnace this week. Barium Steel Corp. reopened the open hearth department at its subsidiary, Phoenix Steel Corp., Phoenixville, Pa.

Sheet and Strip—Hot-rolled sheet demand is catching up with coldrolled. Mills along the East Coast and at Pittsburgh are not yet sold out on either product. But they are

PURCHASING AGENT'S CHECKLIST

Construction equipment makers expect strong sales year. P. 59

Reinforced plastics increase their market penetration in metalworking.

P. 60

Better control of spending for maintenance is vital. P. 61

telling salesmen to go easy in accepting new orders. And they are carefully checking tonnages, keeping distribution to buyers as fair as possible.

Cleveland area mills are booked solid on sheet and strip for February and March rolling. Customers are scrambling to get on the books for April and May. Recent flood damage will cause Republic Steel to lose about a month's tonnage at its Warren, O., plant. Principal products: Hot and cold-rolled strip.

Bar—Orders for both hot-rolled and cold finished bars are moving up sharply. A Pittsburgh mill boosted its order intake on hot-rolled bar 50 pct in the last half of January. At the same mill sales of cold finished jumped 20 pct. Cleveland producers say bars for auto use and forging stock for auto suppliers are booked months ahead. Other bar sizes are not moving quite as fast.

Cold finished bar makers at Chicago estimate first quarter shipments will be more than 25 pct above the last quarter of '58. Hotrolled bar mills there are now on 45-60 day cycles for all sizes.

Structurals — Sales volume is showing a slight upturn, although wide flange beams are in strong demand. A large East Coast structural supplier says the market will need more than inventory building or strike hedging to get it in high gear. Pittsburgh and Chicago mills are quoting 30-day delivery on shapes for sale to Cleveland area users. Midwest fabricators are said to have heavy inventories. Chicago mills are still able to offer four week delivery on most shapes.

Pipe and Tubing—Second quarter linepipe tonnages are completely booked at many mills. However, some can still offer 2-4 week delivery on first quarter orders. Oil country goods buyers are still booking tonnages by the month, not the quarter. Individual orders are fairly small. Standard pipe jobbers are demanding off-the-shelf delivery from mills. Usually they get it.

COMPARISON OF PRICES

(Effective Feb. 10, 1959)

Steel prices on this of major producing Youngstown.	page are areas:	the average Pittsburgh,	of various Chicago,	f.o.b. Gary,	quotations Cleveland,
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of major producing areas: Pi Youngstown.	ttsburgh,	Chicago,	Gary,	Cleveland,
Price advances over previous declines appear in Italics.	week ar	e printed	in Hear	vy Type;
	Feb. 10 1959	Feb. 3 1959	Jan. 13	Feb. 11 1958
Flat-Rolled Steel: (per pound)	2000		2000	
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55		13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base be	ox)			
Tinplate (1.50 lb.) cokes	310.65	\$10.65	\$10.65	\$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675€	6.675€	5.675€	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	46.75	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00∉.	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, rerolling		80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Reds and Skelp: (per pour				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per	nound)			
Base price		6.196¢	6.196¢	5.9676

Finished Steel Composite

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Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Phila-delphia, Buffalo and Birmingham.

Jan. 13 Pig Iron: (per gross ton)
Foundry, del'd Phila.
Foundry, Southern Cin'ti
Foundry, Birmingham
Foundry, Chicago
Basic, del'd Philadelphia
Basic, Valley Turnace
Malleable, Chicago
Malleable, Chicago
Malleable, Valley
Ferromanganese, 74-76 pet Mn,
cents per lb; 1959 1959 \$70.57 73.87 62.50 \$70.57 73.87 62.50 66.50 \$70.57 73.87 62.50 66.50 \$70.51 71.65 62.50 66.50 66.50 70.07 70.07 70.01 66.00 Pig Iren Composite: (per gross ton)
Pig iron \$66.41 \$66.41 \$66.42
 Scrap:
 (per gross ton)
 847.50

 No. 1 steel, Pittsburgh
 \$47.50

 No. 1 steel, Phila area
 39.50

 No. 1 steel, Chicago
 44.50

 No. 1 bundles, Detroit
 40.50

 Low phos., Youngstown
 49.50

 No. 1 machy cast, Pittaburgh
 51.50

 No. 1 mach'y cast, Phila
 56.50

 No. 1 mach'y cast, Chicago
 57.50
 \$47.50 89.50 44.50 40.50 \$43.50 \$5.50 42.50 \$6.50 \$36.50 \$8.00 \$7.50 29.50 \$8.50 46.00 50.50 48.50 54.50 $49.50 \\ 51.50$ 49.50 56.50 49.50

 Coke, Connellsville: (per net ton at oven)

 Furnace coke, prompt\$14.50-15.50 \$14.50-15.50 \$14.50

 Foundry coke, prompt\$18.50

 18.50 \$18-18.50 \$17.50-19

Nonferrous Metals: (cents per po	und to la	arge buyer	6.0	
Copper, electrolytic, Conn	30.00	30.00	29.00	25.00
Copper, Lake, Conn	30.00	30.00	29.00	25.00
Tin. Straits. N. Y	102.375†	101.375*	99.125	93.00
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	11.80	11.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex	29.50	29.50	29.50	33.00
† Tentative. ‡ Average. * Revise	d.			

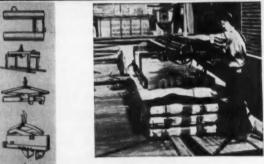
Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittaburgh, Philadelphia and Chicago.

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MANSAVER® GRABS Handle Millions of Tons in Your Industry

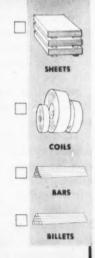


Over 90% Savings Produced by This Grab!

Five men, who previously were needed to unload box cars, were replaced with a crane, a Mansaver Grab, and one man.

The height of storage piles was also doubled, cutting floor space in half. The same unit was further utilized for unloading motor trucks.

Although there are a limited number of socalled standard grabs, most Mansavers are available to meet individual requirements, in manual, LITERATURE AND MORE semi-automatic, fully-automatic, and power-operated styles.



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MANSAVER INDUSTRIES, INC.

3106 East St., New Haven, Conn. Also Manufactured in England

Rising Prices Take A Breathing Spell

Prices this week have leveled off, for the most part, but it won't last.

Mills are relighting idle openhearths. Export activity is picking up.

• Some of the steam has gone out of the market but there is plenty of power in reserve. Any new buying of sizable tonnage would send scrap prices on the way up again.

The relative inactivity in the scrap market during the past week could be regarded as a pause in a rising market rather than a leveling off. The top has probably not yet been reached. The steel operating rate is still climbing.

Mills are relighting openhearth furnaces that have been shut down for many months. These will be using more scrap as the operating rate goes up.

But for the time being, mills are sitting on comfortable scrap inventories.

Meanwhile, dealers are taking advantage of the lull to rebuild their own inventories. Higher prices are bringing out a lot of scrap, despite winter weather.

Adding to the strength in port districts are new export orders—some already signed and some in the negotiations stage. The new export business, while not expected to be especially big, will be large enough to set a rock-bottom foundation under port district prices.

The IRON AGE heavy melting Composite Price is unchanged at \$43.83.

Pittsburgh — The market appeared to be on dead center this week. There was not much activity, but what there was confirmed existing prices of the major grades. At the same time, the market was sensitive enough that mill buying of any consequence would meet with quick reaction from the standpoint of price. There was no doubt that strengthening demand for new steel will force mill operating rates higher, with a resulting increase in demand for scrap.

Chicago — Prices held strongly despite mill resistance to new sales. Broker buying prices are continuing strong but there are indications that broker opposition to further dealer-level price increases is growing. In the absence of heavy new mill buying, trading of small quantities is heavy.

Philadelphia — The fire is out under this market. Mills loaded up heavily on scrap during the past few weeks. Now they're pretty comfortably fixed. A few consumers are scheduling shipments a carload at a time, which indicates they don't need it badly. Negotiations are in progress for new export business. While the new export orders are not expected to be huge, they would be large enough to stabilize existing prices.

New York—This market is quiet with prices unchanged. But there is belief that steelmaking and blast furnace grades will climb on new business. Stainless continues firm with movement good.

Detroit—Dealers seem willing to part with scrap at current prices. A Canadian order for No. 1 grades, at \$1 to \$2 over last week's prices, brought quick response from dealers and most of the order was quickly filled.

Cleveland—Some steam has gone out of the market, but underlying strength is still there. Mills generally have good scrap stockpiles and plenty of reserve hot metal capacity. Factory bundles are moving at \$1 lower.

St. Louis—Scrap movement continues at a moderate rate, but openhearth grades are down \$1. This can be considered a readjustment as shipments of premium priced scrap into the district by barge during the last two weeks ended.

Birmingham—Scrap seems to be moving a little better but there is still no market for No. 1 steel items. Dealers are taking advantage of higher prices in other areas. Local activity is in foundry and specialty grades.

Cincinnati—Market is in good balance with shipments steady on old orders. Mills aren't pushing for new tonnage. Some factory bundles will probably move out of the area.

Buffalo—All prices were up \$2 to \$3 this week on basis of large sales of several items. There were no sales of cast scrap but these grades increased \$3 in sympathy with the market.

Boston — Prices are holding steady. There has been a slight pickup in business.

West Coast — The market is steady. Mills are taking only their normal supply of scrap. Second quarter outlook depends on size of export orders.

Houston—The domestic market is quiet. The local mill is still dipping into its inventory. Export appears stronger with one ship due to begin loading this month.

Pittsburgh

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No. 1 hvy. melting\$47.00 t	0 \$48.00
No. 2 hvy. melting 38.00 t	0 39.00
No. 1 dealer bundles 47.00 t	
No. 1 factory bundles 53.00 t	
No. 2 bundles 33.00 t	
No. 1 busheling 47.00 t	0 48.00
Machine shop turn 25.00	0 26.00
Shoveling turnings 29.00 i	to 30.00
Cast iron borings 29.00	
Low phos. punch'gs plate. 53.00 t	
Heavy turnings 39.00	
No. 1 RR hvy. melting 50.00 t	
Scrap rails, random lgth 55.00	
Rails 2 ft and under 58.00	to 59.00
RR specialties 54.00 t	55.00
No. 1 machinery cast 51.00 t	
Cupola cast 45.00	
	to 44.00
Stainless	
18-8 bundles and solids. 225.00 t	to 230.00
18-8 turnings 120.00 t	0 125.00
430 bundles and solids 125.00 t	n 130.00
410 turnings 50.00	60.00
	00.00

Chicago

No. 1 hvy. melting\$	44.00	to	\$45.00
No. 2 hvy. melting	38.00		
No. 1 dealer bundles	44.00	to	45.00
No. 1 factory bundles	49.00		
No. 2 bundles	31.00		32.00
No. 1 busheling	44.00		45.00
Machine shop turn	26.00		27.00
Mix. bor. and turn	25.00		
Shoveling turnings	27.00		
Cast iron borings	26.00		27.00
Low phos. forge crops	56.00		
Low phos. punch'gs plate.	00.00	to	01.00
14 in. and heavier	52.00	40	53.00
Low phos. 2 ft and under	50.00		51.00
No. 1 RR hvy. melting	48.00		49.00
derap rails, random lgth	53.00		
Rerolling rails	65.00		
Rails 2 ft and under	61.00		
Angles and splice bars	56.00		
RR steel car axles	73.00		
RR couplers and knuckles	52.00		
No. 1 machinery cast	57.00		
Cupola cast	50.00		
Cast iron wheels	44.00		
	58.00		
Malleadie	46.00		
Stove plate	53.00		
Steel car wheels	53.00	to	54.00
Stainless	90 00		005 00
18-8 bundles and solids. 2			
18-8 turnings	20.00	to	125.00
430 bundles and solids1	20.00	to	125.00
480 turnings	90.00	to	65.00

Philadelphia Area

No. 1 hvy. melting	\$39.00	to	\$40.00
No. 1 hvy. melting	36.00		
No. 1 dealer bundles	40.00	to	41.00
No. 8 bundles	25.00		27.00
No. 1 busheling	40.00		41.00
Machine shop turn	21.00		22.00
Mixed bor. short turn	22.00		23.00
Cast iron borings	22.00		23.00
Shoveling turnings	24.00		25.00
Clean cast, chem, borings.	30.00		31.00
Low phos. 5 ft and under.	43.00	to	44.00
Low phos. 2 ft punch'gs	44.00		45.00
Elec. jurnace bundles	41.00	to	42.00
Heavy furnings	35.00		36.00
RR specialties	45.00	to	46.00
Rails 18 in, and under	59.00	to	60.00
Cupola cast	38.00	to	42.00
preservy breakable cast	42.00	to	43.00
Cast fron car wheels	44.00	to	45.00
Malleable	65.00		66.00
No. 1 machinery cast	49.00	to	50.00
		-	

Cincinnati

Brokers buying prices per gre	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 1 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 bundles	26.00 to 27.00
Machine shop turn	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	
Rails, random length	
Rails, 18 in. and under	
No. 1 cupola cast	45.00 to 46.00
Hvy. breakable cast	40.00 to 41.00
Drop broken cast	49.00 to 50.00

Youngstown

No. 1 hvy. melting		9		0	\$47.00	to	\$48.00
No. 1 hyy, melting .					38.00	to	39.00
No. 1 dealer bundle							
No. 2 bundles			٥		32.00	to	33.00
Machine shop turn.					20.50	to	21.50
Shoveling turnings					20.50	to	21.50
Low phos. plate				٠	49.00	to	50.00

Iron and Steel Scrap

Going prices of Iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tannages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

Oleveland	
No. 1 hvy. melting\$43.50 to \$4-	4.50
No. 2 hvy. melting 35.50 to 3	6.50
	4.50
	8.00
	0.50
	4.50
Machine shop turn 16.50 to 1	7.50
	2.50
	2.50
	2.50
Cut structural & plates, 2 ft	
& under 51.00 to 5	2.00
Drop forge flashings 43.50 to 4	4.50
Low phos. punch'gs plate. 44.50 to 4	5.50
Foundry steel, 2 ft & under 44.00 to 4	5.00
	9.00
	0.00
	1.00
	8.00
Railroad cast 54.00 to 5	5.00
	3.00
	0.00
	8.00
Stainless	
18-8 bundles	0.00
18-8 turnings115.00 to 12	
430 bundles120.00 to 12	

Buffalo

No. 1 hvy. melting	\$41.00	to	\$42.00
No. 2 hvy. melting	34.00	to	35.00
No. 1 busheling	41.00	to	42.00
No. 1 dealer bundles	41.00	to	42.00
No. 2 bundles	30.00	to	31.00
Machine shop turn	19.00	to	20.00
Mixed bor. and turn	21.00	to	22.00
Shoveling turnings	23.00	to	24.00
Cast iron borings	19.00	to	20.00
Low phos. plate	45.00	to	46.00
Structurals and plate			
2 ft and under	49.00	to	50.00
Scrap rails, random lgth	51.00	to	52.00
Rails 2 ft and under	61.00	to	62.00
No. 1 machinery cast	51.00	to	52.00
No. 1 cupola cast	47.00	to	48.00

St. Louis

Ji. Louis			
No. 1 hvy, melting	37.00	to	\$38.00
No. 2 hvy. melting	35,00		
No. 1 dealer bundles	40.00	to	41.00
No. 2 bundles	28.00	to	
Machine shop turn	18.00	to	19.00
Shoveling turnings	20.00	to	21.00
Cast iron borings	22.00	to	23.00
No. 1 RR hvy, melting	45.00	to	46.00
Rails, random lengths	49.00	to	50.00
Rails, 18 in. and under	52.00	to	53.00
Angles and splice bars	49.00	to	50.00
RR specialties	47.00	to	48.00
Cupola cast	49.00	to	50.00
Heavy breakable cast	38.00	to	39.00
Cast iron brake shoes	37.00	to	38.00
Stove plate	45.00	to	46.0
Cast iron car wheels	45.00		
Rerolling rails	61.50	to	62.50
Unstripped motor blocks	40.00		

Birmingham

No. 1 hvy. melting		
No. 2 hvy. melting	29.00 to	
No. 1 dealer bundles	33.00 to	34.00
No. 2 bundles	23.00 to	24.00
No. 1 busheling	33,00 to	34.00
Machine shop turn	23.00 to	24.00
Shoveling turnings	24,00 to	25.00
Cast iron borings	14.00 to	15.00
Electric furnace bundles	39.00 to	40.00
Elec. furnace, 3 ft & under	36.00 to	37.00
Bar crops and plate	43.00 to	44.00
Structural and plate, 2 ft.	43.00 to	44.00
No. 1 RR hvy. melting	38.00 to	39.00
Scrap rails, random igth	44.00 to	45.00
Rails, 18 in. and under	51.00 to	52.00
Angles and splice bars	44.00 to	45.00
Rerolling rails	56,00 to	57.00
No. 1 cupola cast	53.00 to	54.00
Stove plate	53.00 to	
Cast iron car wheels	42.00 to	43.00
Unstripped motor blocks		

New York

HEN IOIR
Brokers buying prices per gross ton on cars:
No. 1 hvy. melting\$29.00 to \$30.00
No. 2 hvy. melting 26.00 to 27.00
No. 2 dealer bundles 20.00 to 21.00
Machine shop turnings 11.00 to 12.00
Mixed bor, and turn 14.00 to 15.00
Shoveling turnings 15.00 to 16.00
Clean chem. cast. borings. 23.00 to 25.00
No. 1 machinery cast 37.00 to 38.00
Mixed yard cast 33.00 to 34.00
Heavy breakable cast 32.00 to 33.00
Stainless
18-8 prepared solids 190.00 to 195.00
18-8 turnings 80.00 to 85.00
430 prepared solids 75.00 to 80.00
430 turnings 20.00 to 25.00

Detroit

Delitoli	
Brokers buying prices per gross ton	on cars:
No. 1 hvy. melting\$38.00 to	\$39.00
No. 2 hvy. melting 32.00 to	33.00
No. 1 dealer bundles 40.00 to	
	26.00
	39.00
	38.00
Machine shop turn 15.00 to	
Mixed bor. and turn 17.00 to	
Shoveling turnings 18.00 to	
Cast iron borings 17.00 to	
Heavy breakable cast 36.00 to	
Mixed cupola cast 43.00 to	
Automotive cast 48.00 to	0 49.00
Stainless	
18-8 bundles and solids .210.00 to	0 215.00
18-8 turnings 100.00 to	o 105.00
430 bundles and solids 105.00 to	0 110.00

Roston

Brokers buying	nrices ner	gross ton	on cars:
No. 1 hvy. m	elting	\$30.00	to \$31.00
No. 2 hvv. me	elting	24.00	to 25.00
No. 1 dealer	bundles	30.00	to 31.00
No. 2 bundles		17.00	to 18.00
No. 1 bushel		30.00	to 31.00
Machine shop			to 10.00
Shoveling tur	nings	11.00	to 12.00
Clean cast. cl	hem. borins	rs. 18.00	to 19.00
No. 1 machin			to 34.00
Mixed cupola			to 33.00
Heavy break			to 31.00
Stove plate		29.00	to 30.00

San Francisco

.\$32.00 to	\$34.00
. 30.00 to	32.00
. 28.00 to	30.00
	22.00
	15.00
	15.00
, 44.00 to	45.00
	\$36.00
	.\$32.00 to . 30.00 to . 28.00 to

No. 2 hvy. melting	34.00
No. 1 dealer bundles	33.00
No. 2 bundles	18.00
Machine shop turn	15.00
Shoveling turnings	17.00
Cast iron borings	17.00
Elec. furn. 1 ft and under (foundry)	47.00 47.00
Seattle	
No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast	36.00
Mixed yard cast	36.00

Hamilton Ont.

Brokers buying prices per gross ton	on cars
No. 1 hyv. melting	334.5
No. 2 hvy. melting	30.5
No. 1 dealer bundles	34.0
No. 2 bundles	25.00
Mixed steel scrap	26.5
Bush., new fact., prep'd	34.5
Bush., new fact., unprep'd	28.5
Machine shop turn	13.0
Short steel turn	17.0
Mixed bor. and turn	13.0
Rails, rerolling	37.0
Cast scrap\$39.00 t	0 41.0

Houston

Brokers buying prices	1	pe	81			T	880	ŧ	en.	on	CRTS:
No. 1 hvy. melting			0								35.00
No. 2 hvy. melting .											33.00
No. 2 bundles											22.50
Machine shop turn.											15.00
Shoveling turnings	0	0									19.00
Cut structural plate	1										
2 ft & under			9				\$44	d	00	to	45.00
Unstripped motor b	lk	ж	ı	CS	١.		31	J	00	to	32.00
Cupola cast							43	J	90	to	44.00
Heavy breakable co	LS	ıt.		-			- 26	u	50	to	27.50

Is Russia Short Of Aluminum?

A high level Red says the country is so short of aluminum that even a 180 pct boost in output isn't enough.

Free World trade finds this hard to believe because of Red cut rate sales in 1958.

■ Did Russia mislead the Free World on its ability to produce when it unloaded some of its aluminum in 1958. New information indicates it did.

Offering of Russian aluminum at below the going price to consumers in England early in 1958 had pretty much convinced the Free World that, at the least, Russia wasn't hurting for aluminum. But there were no reliable figures to hang these conclusions on.

Says Things Are Tough—Now comes a report from the 21st Congress of the Soviet Communist Party. A member of the Presidium, Averki Aristov, complains of the serious shortage of aluminum in Russia. And he is not referring to consumer goods applications.

The high level Red says the lack of aluminum is hampering machinery construction and expansion in the electrical industry. Further, he says not even the monumental goals of the Seven Year Plan will ease the strain.

This plan calls for a 180 pct expansion of aluminum production by 1965, while overall production is rising 61 pct.

300 Pct Would Do It — Mr. Aristov's suggestion: Aluminum

production be increased 280 to 300 pct in the next seven years.

The thought that the Reds may not have enough aluminum took most of the Free World by surprise. One observer in government admitted the lack of statistics on which to base a conclusion, but said he was under the impression Russia had enough aluminum to use this metal to pay some of its debts incurred trading outside the Iron Curtain.

How Do You Figure It?—Another Washington observer said the Russia report contradicted his impression. He suggests that if this report is true, the sale of aluminum in the Free World might have resulted from the change in emphasis from manned aircraft to missiles. It just might have been cheaper to sell at the price obtained than to warehouse the metal for even a short time.

Another observer suggests the Reds may have needed some foreign exchange badly at the time. The Russian ruble and Russian prices are so tightly state-controlled they are lightly regarded on this side of the Iron Curtain.

And still another observer believes Russian moves are all aimed at creating confusion in Free World markets whether the country is short of aluminum or not.

Have or Have Not—Historically, there is no clear cut evidence of the likely condition of the aluminum industry in Russia today.

Known bauxite deposits in Russia are generally poor grade.

In the 1940's and early 1950's Russia was considered more of a have not than a have aluminum and bauxite nation. But we know little of her advances in ore treating.

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From Us—About two thirds of the aluminum used by Russia in World War II was lend lease metal. And even this was so short that at no time did she have enough to build enough airplanes to control her own skies.

During the recent Hungarian uprising, attention was widely drawn to the rich Hungarian bauxite deposits as one of the reasons Russia could not afford to let Hungary go.

And it is known that the Reds pretty well stripped East Germany's aluminum fabricating facilities right after World War II.

Russia has been a net aluminum exporter, as far as we know, since 1955. At the recently concluded Brussels Worlds Fair, Russia sought to give the impression she had plenty of aluminum and knew what to do with it. The Russian pavilion contained 396 tons of aluminum, more than any other nation, and more in fact than the 16½ tons used in the pavilion of the aluminum industry.

Primary Prices

(cents per lib)	current price	iast price	date of change
Aluminum pig	24.78	24.00	8/1/88
Aluminum Ingot	28.80	20.10	8/1/88
Copper (E)	30.00	29.00	2/3,59
Copper (CS)	30.00	29.50	1/28 58
Copper (L)	30,00	29.00	2 3 56
Lead, St. L.	11.00	12.80	1/21/80
Lead, N. Y.	12.00	13.60	1/21/00
Magnesium Inget	36.00	34.00	8/13/86
Magnesium pig	38.25	33.78	8/13/86
Nickel	74.00	64.60	12/8/88
Titanium sponge	162-182	185-208	11/3/54
Zinc, E. St. L.	11.80	11.00	11/7/80
Zinc, N. Y.	12.00	11.60	11/7/86

ALUMINUM: 99% Ingot frt allwd. COP-PER: (E) — electrolytic, (CS) — custom smelters, electrolytic. (L) — lake. LEAD: common grade. MAGNESIUM: 99.8% ply Velasco, Tex. NICKEL: Port Colbourne. Canada. ZINC: prime western. Tin: See right; Other primary prices, pg. 150.

Lead

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le

Robert L. Ziegfield, secretarytreasurer, Lead Industries Assn. is painting a bright picture of lead's future. The research program launched in 1958, under Dr. Schrade Radtke, is moving along nicely. The group will spend about four times more this year than last. And some profitable results are already coming in sight.

Two "intriguing" projects for 1959: Reinforcing lead with a felted mat of stronger metal fibers to keep lead's desirable characteristics and improve its physical properties; and development of new organo-lead compounds. The most important of these now is tetraethyl lead. From scratch in 1923 this market now takes 175,000 tons of lead per year.

But while Mr. Ziegfield was looking ahead, the current lead market was growing shaky. More observers were predicting a lower price fairly soon.

Copper

The higher price for producers copper hasn't taken any of the edge off the world copper market.

In this country both producers and custom smelters say demand is good at 30¢ per lb. There are reports some scrap dealers are holding back for an even stronger market and a higher price.

Activity on the Commodity Exchange in New York is up very slightly. And London prices which fell in the face of the higher producers' price in the U.S. have more than recovered.

Despite the large number of orders for immediate delivery, there is no doubt there is hedging. Buyers want delivery as soon as possible because there is still a chance the copper price will go higher.

Tin prices for the week: Feb. 4-101.75; Feb. 5-102.00; Feb. 6-102.00; Feb. 9-102.375; Feb. 10 -102.375.*

*Estimate.

How much can you save with the right strapping and equipment?

Save as much as 50-80% on strapping materials alone. Hundreds of users report savings as high as 80% when oval steel strapping is substituted for their present materials. This doesn't mean that oval is a cure-all. Your specific packaging problem might best be solved with flat steel strapping, or wire . . . or pressure sensitive tape. No single strapping material has a precedent in our recommendation. We offer all types. It all depends on which will do the best, lowest cost job for you.

Be sure the equipment is right. Maybe the strapping material isn't your problem. Possibly your best cost-cutting advantage will result from the type of equipment you're using. Perhaps with your volume, you could cut costs tremendously with Power Driven equipment. Or maybe you need Fully Automatic equipment, or an improved manual tool. Here again, we are unbiased. We offer you a complete line of all types of strapping tools and equipment. The determination is what do you need?

Maybe you're over-protecting. Possibly you're not only using strapping that is heavier than necessary . . . but you might also be using the wrong strapping methods. The soundest way to judge right from wrong on your packaging problem, is to go over every detail of your operation with a seasoned expert. Your representative from A. J. Gerrard is such a man.

What's your specific problem? Allow us to gather the details. Then let us apply this information to determine the best material and methods for you. Maybe your present practices are right. Maybe we can help you improve upon them. A personalized survey is yours for the asking. Simply use the coupon below.

COMPANY_

NAME

CITY



FULLY AUTOMATIC EQUIPMENT is available for the application of flat steel strapping, round steel strapping or pressure sensitive tape



POWER DRIVEN EQUIPMENT can slash your time and manpower requirements. A personalized survey by A. J. Gerrard will determine if powered equipment fits your operation.



JUST ONE OF MANY WAYS that this package could be strapped is demonstrated here. This method saves the user as much as 75% on strapping materials alone.



ZONE___STATE

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed) Flat Sheet (Mill Finish and Plate) ("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	3.250-
1100, 3003	45.7	43.8	42.8	43.3
	53.1	48.4	46.9	46.0
	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6		
6-8	42.7-44.2	51.1-54.8		
12-14	42.7-44.2	52.0-56.5		
24-2636-38	43.2-44.7 46.7-49 2	62.8-67.5 86.9-90.5		

Screw Machine Stock-2011-T-3

Size"	34 36-36		%-1	114-114
Price	62.0	61.2	50.7	57.3

Roofing Sheet, Corrugated

.coming	2110011			-		
(Per	sheet,	26"	wide	base,	16,000	lb)

Length*→	72	96	120	144
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823
	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed) Sheet and Plate

fype→ Gage→		.250 3.00	.250- 2.00	.188	.081	.083
AZ31B Sta Grade	and,		67.9	69.0	77.9	106,1
AZ31B Sp	BC		93.3	95.7	108.7	171.8
Tread Plat	ie		70.6	71.7		
Tooling Pl	ate	73.0				

Extruded Shapes

factor->	6-8	12-14	24-26	36-38	
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2	
Spec, Grade (AZ31B)	84.6	85.7	90.6	104.2	

Alloy	Ingot			
	Die Casting)			
AZ63A,	AZ92A, AZ91C	(Sand Casting)	40.75	(Velsaco, Tex.)

NICKEL, MONEL, INCONEL

(Base	8 19	rices f.o.	b. mill)	
	"A	" Nickel	Monel	Inconel
Sheet, CR		126	106	128
Strip, CR		124	108	138
Rod, bar, HR		107	89	109
Angles, HR .		107	89	109
Plates, HR .		120	105	121
Seamless tube		157	129	200
Chot blooks			97	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13		51.36	54.32
Brass, Yellow	47.40	47.94	47.34	50.81
Bram, Low	50.13	50.67	50.07	53.44
Brass, R L	51.09	51.63	51.03	54.40
Brass, Naval	52.08		45.89	55.49
Muntz Metal	50.15		45.46	
Comm. Br.	52.14	53.14	52.54	55.66
Mang. Bz.	55.82		49.42	
Phos. Bz. 5%	73.82		74.30	

TITANIUM

(Base prices, f.o.b. mill)

(Base prices, f.o.b. mtll)

Sheet and strip, commercially pure, \$6.90-\$7.40; alloy, \$14.35; Plate, HR, commercially pure, \$5.00-\$5.76; alloy, \$7.76-\$8.50. Wire, rolled and/or drawn, commercially pure, \$5.50-\$6.90; alloy, \$8.90-\$9.50; Bar, HR or forged, commercially pure, \$4.25-\$4.65; alloy, \$4.25-\$7.15; billets, HR, commercially pure, \$3.55-\$4.10; alloy, \$3.55-\$5.75.

PRIMARY METAL (Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex 29.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be
Beryllium copper, per lb conta'd Be.\$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading\$71.50
Bismuth, ton lots\$ 2.25
Cadmium, del'd \$ 1.45
Calcium, 99.9% small lots \$ 4.55
Chromium, 99.8% metallic basis\$ 1.31
Cobalt, 97-99% (per lb)\$1.75 to \$1.82
Germanium, per gm, f.o.b. Miami,
Okla., refined 35.00 to 42.00
Gold, U. S. Treas., per troy oz\$35.00
Indium, 99.9%, dollars per troy oz. \$ 2.25
Iridium, dollars per troy oz\$70 to \$80
Lithium, 98%\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York\$218 to \$221
Nickel oxide sinter at Buffalo, N. Y.,
or other U. S. points of entry,
contained nickel 69.60
Palladium, dollars per troy oz\$15 to \$17
Platinum, dollars per troy os\$50 to \$55
Rhodium\$120.00 to \$125.00
Silver ingots (# per troy oz.)90.375
Thorium, per kg\$43.00
Vanadium 3.45
Zirconium sponge \$ 5.00

REMELTED METALS

Zirconium sponge

Brass Ingot

(C	ents	9	18	7	l	b	d	e	14	ir	e	7	e	d	,	-	ON	31	rl	lo	d	d	a)
85-5-5	ing	ot																					
No.	115			4		*									×								28.0
No.	120																						27.0
No.	123																						26.0
80-10-	10 iz	18	0	t													-		-	_	-		
No.	305	-																					32.2
	315																						30.2
88-10-	2 ins	CO	t																				
No.	210																						39.7
No.	215																						35.5
	245																						
Yellov																							
No.	405																						23.0
Mangi																							
No.	421						*																24.7

Aluminum Ingot

(Cents per lb del'd 30,000 lb and or	ver)
95-5 aluminum-silicon alloys	
0.30 copper max24.75-	25.00
0.60 copper max24.50-	24.75
Piston alloys (No. 122 type) 24.25-	25.25
No. 12 alum. (No. 2 grade) 21.50-	22.00
108 alloy	22.50
195 alloy	26.00
13 alloy (0.60 copper max.) 24.25-	24.75
AXS-679 (1 net sine)	

(Effective Feb. 9, 1959)

Steel	deoxidizing	aluminum	notch	ba
		And on the	A	

Grade	1-95-9714%						22.50-23.60
	2-92-95% .						
Grade	3-90-92% .						20.25-21.30
Grade	4-85-90% .						17.50-18.50

SCRAP METALS

Brass Mill Scrap (Cents per pound, add 1¢ per lb for

shipments	of	20,000	ib and	over)
			Heavy	Turnings
Copper			25	2414
Yellow brass			19	17%
Red brass			2216	21%
Comm. bronz			22%	22 16
Mang. bronze			17%	16 %
Free cutting I	nod .	ends.	1814	

Customs Smelters Scrap (Cents per pound carload lots, delivered

to refi	nery)
No. 1 copper wire	25%
No. 2 copper wire	24%
Light copper	28
*Refinery brass	24%
Copper bearing mate	
8 Dev conner conte	nt

EAST

Dry copper content.

	1.01	gor makers a	crab	
(Cents	per	pound carload to refinery)		delivered
No. 1 c	onno	r wire		25 %

No. 1 copper wire	25%
No. 2 copper wire	2414
Light copper	22
No. 1 composition	20 1/2
No. 1 comp. turnings	20
Hvy. yellow brass solids	1434
Brass pipe	16 1/4
Radiators	16 1/2
Aluminum	
Mixed old cast 12	-13
Mixed new clips 15	16
Mixed turnings, dry 13	-14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23 1/2 - 24
No. 2 copper wire	21 1/2 22
Light copper	191/2-20
Auto radiators (unsweated).	1414-143
No. 1 composition	17% -18%
No. 1 composition turnings	16%-17%
Cocks and faucets	141/2-15
Clean heavy yellow brass	1234-133
Brass pipe	141/215
New soft brass clippings	15 -15 1/2
No. 1 brass rod turnings	12 1/2 13
Aluminum	

Alum pistons and atruts 6 6 1/4 1100 (2s) aluminum crankcases 9 1/2 - 10 1100 (2s) aluminum clippings 13 - 13 1/4 01d sheet and utensils 5 1/2 - 10 Borings and turnings 6 6 6 1/4 110 2020 (24S) clippings 11 - 11 1/4 Zinc

Nickel and Monei	
Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54 52-54
New Monel clippings	30-31
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead Soft scrap lead

Miscellaneous Block tin 75 -76

No. 1 pewter	
Auto babbitt 39 -40	
Mixer common babbitt 91/2-10	
Solder joints 1314-1314	
Siphon tops 42	
Small foundry type 10 1/4-10 %	
Monotype 101/4-101/4	
Lino. and stereotype 91/2- 9%	
Electrotype 8 %- 8 %	
Hand picked type shells 6%-7	
Lino. and stereo. dross 2%-3	
Electro dross 2%- 2%	

	STEEL	BILLE	TS, BLO	OMS.	PIL-		SHAPES	5						
			SLABS	,	ING	STE	RUCTUR	ALS			STR	IP		
•	PRICES	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Het- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
	Bethlehem, Pa.			\$119.00 B3		5.55 B3	8.10 B3	5.55 B5						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	\$.10 B3, R3	7.425 S10, R7	7.575 B3			
	Phila., Pa.			- DJ					100	7.875 P15				
	Harrison, N. J.													15.55 C//
	Conshohocken, Pa.		\$104.50 .42	\$126.00 //2					5.15 A2		7.575 A2			
	New Bedford, Mass.									7.875 R6				
_	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3							
EAST	Boston, Mass.									7.975 T8				
	New Haven, Conn.									7.875 DI				
	Baltimore, Md. Phoenixville, Pa.					F FF D1		5.55 P2		7.425 T8				15.90 78
	Sparrows Pt., Md.					5.55 P2		3.33 FZ	5.10 B3		7.575 B3			
	New Britain, Bridgepart, Wallingford, Conn.			\$119.00 N8						7.875 W1,S7				
	Pawtucket, R. I. Worcester, Mass.			-						7.975 N7, A5				15.90 N7 15.70 T8
_	Alton, Ill.								5.30 L1					
	Ashland, Ky.							-	5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T5						7.425 G#		10.80 G#		
	Chicago, III. Franklin Park, III. Evanston, III.	\$80.00 UI, R3	\$99.50 UI, R3,W8	\$119.00 UI, R3,W8	6.50 UI	5.50 UI, W8,P13	8.85 U1, Y1,W8	5.50 UI	5.10 W8, N4,AI	7.525 A1, T8, M8	7.575 W8		8.40 W8, S9,13	15.55 Al S9,G4, T
	Cleveland, Ohio								•	7.425 A5,J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5					5.10 G3, M2	7.425 M2, S1, D1,P11	7.575 G3	10.80 SI		
	Anderson, Ind.									7.425 G4				
WEST	Gary, Ind. Harbor, Indiana	\$80.00 UI	\$99.50 UI	\$119.00 UI,		5.50 UI, 13	8.05 UI, J3	5.50 /3	5.10 UI, I3, YI	7.425 YI	7.575 U1, 13, Y1	10.90 Y/	8.40 UI, YI	
MIDDLE	Sterling, III.	\$88.88 N4				5.50 N4			5.20 N4					
W	Indianapolis, Ind.									7.575 R5				15.70 R5
	Newport, Ky.								5.10 A9				8.40 49	
	Niles, Warren, Ohio Sharen, Pa.		\$99.50 SI; CIO	\$119.00 C10,S1					5.10 R3, S/	7.425 R3, T4,SI	7.575 R3, SI	10.80 R3, S/	8.40 SI	15,55 SI
	Owensbere, Ky.	\$88.00 G5	\$99.50 G5	\$119.00 G5										
	Pittaburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 UI, P6	\$99.50 UI, CII,P6	\$119.00 UI, CII,B7	6.50 UI	5.50 UI, J3	8.05 UI, J3	5.50 UI	5.10 P6	7.425 <i>J</i> 3, <i>B</i> 4 7.525 <i>E</i> 3			8.40 59	15.55 59
	Weirton, Wheeling, Fellansboo, W. Va.				6.50 UI, W3	5.50 W3		5.50 W3	5.10 W3	7.425 F3	7.575 W3	10.80 W3		
	Youngstown, Ohio	\$80.00 R3	\$99.50 YI,	\$119.00 Y/			8.05 Y/		5.10 U	7.425 Y1,R5	7.575 UI,	10.95 YI	8.40 UI, YI	15.55 R5
-	Fontana, Cal.	\$90.50 K1		\$140.00 K1		6.30 KI	8.85 K1	6.45 K1	5.825 K1	9.29 KI				
	Geneva, Utah		\$99.50 C7			5.50 C7	8.85 C7							
	Kansas City, Mo.					5.60 S2	8.15 S2						8.45 S2	
	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2		6.20 C7, B2	8.75 B2		5.85 C7, B2	9.30 C1,R5			9.60 B2	17.75 J3
WEST	Minnequa, Colo.					5.80 C6			6.20 C6	9.375 C6				
-	Portland, Ore.					6.25 02								
	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2					
	Seattle, Wash.		\$113.00 B2			6.25 B2	8.50 B2		6.10 B2					
_	Atlanta, Ga.					5.70 48			5.10 48					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 72	\$99.50 T2			5.50 T2 R3,C16	8.95 T2		\$.10 T2, R3,C/6		7.575 T2			
30	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 SZ		5.60 S2	8.15 52						8.65 SZ	

									-	WIRE			
	STEEL				SHE	ETS				ROD	TINPI	LATE†	
F	PRICES	Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Terns	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowar Enamelin 29 ga.
	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	deduct 35¢ fr	ted mfg. terne rom 1.25-lb.	
	Claymont, Del.										th./0.25 lb. a	a price, 0.75 dd 55é.	
	Coatesville, Pa.										Can-makin BLACKPLAT	ng quality FE 55 to 128	-
	Conshohocken, Pa.	5.15 /12	6.325 A2				7.575 A2				lb. deduct \$2 1.25 lb. coke	.20 from base box.	
	Harrisburg, Pa.										* COKES:	1.50-lb.	
	Hartford, Conn.										25é; 0.75-lb.	: 0.50-lb. add add 65¢; 1.00-	
EAST	Johnstown, Pa.									6.40 B3	lb. add \$1.00 1.00 lb./0.25	Differential lb. add 65¢.	
EL .	Fairless, Pa.	5.15 <i>UI</i>	6.325 UI				7.575 UI	9.325 UI			\$10.50 UI	\$9.20 UI	
	New Haven, Conn.												3
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.40 B3	\$9.10 B3	
	Worcester, Mass.									6.70 45			
	Trenton, N. J.												
	Alton, III.									6.60 <i>L1</i>			
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7						-
	Canton-Massillon, Dover, Ohio			6.875 R1, R3									
	Chicago, Joliet, III.	5.10 W8, A1					7.525 UI, W8			6.40 A5, R3,W8			
	Sterling, III.									6.50 N4, K2			
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5			
1	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3					
	Newport, Ky.	5.10 Al	6.275 Al					-					
ST	Gary, Ind. Harbor,	5.10 UI,	6.275 UI.	6.875 UI.	6.775 UI,	7.225 UI	7.525 UI,	9.275 UI,		6.40 YI	\$10.40 UI.	\$9.10 /3, UI, YI	7.85 U1,
WEST	Indiana	B,YI	13,YI	13	13,Y1		Y1,13	YI			YI		
DLE	Granite City, III.	5.20 G2	6.375 G2	6.975 G2	6.875 G2			-				\$9.20 G2	7.95 G2
MIDDLE	Kokomo, Ind.			6.975 C9						6.50 C9			
	Manafield, Ohio	5.10 E2	6.275 E2			7.225 E2			-	* -			
	Middletown, Ohio Niles, Warren, Ohio	F 10 B2	6.275 A7	6.875 A7	6.775 A7	7.225 A7	a rar Dr	A 227 B2	-			\$9.10 R3	
	Sharon, Pa. Pittsburgh,	5.10 R3, SI 5.10 UI,	6.275 R3	6.875 R3 7.65 R3*	6.775 SI	R3	7.525 R3, SI 7.525 UI,	9.275 R3,	10.025 UI.	6.40 A5,	\$10.40 W5.	\$9.10 KJ	7.85 UI,
	Midland, Butler, Donora, Aliquippa, McKeesport, Pa,	J3,P6	J3,P6	J3 7.50 E3*	6.11301		J3	J3	J3	J3,P6	J3	j3	J3
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3,W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.40 W5, W3	\$9.10 W5, W3	7.85 W5
	Youngstown, Ohio	5.10 UI, YI	6.275 Y/	7.50 J3*	6.775 YI		7.525 YI	9.275 YI		6.40 YI			
	Fontana, Cal.	5.825 K1	7.40 KI				8.25 K1	10.40 KI			\$11.05 K1	\$9.75 KI	
	Geneva, Utah	5.20 C7											
<u> </u>	Kansas City, Mo.									6.65 S2			
WEST	Los Angeles, Torrance, Cal.									7.28 B2			
	Minnegua, Colo.			-	-	-	-	-	-	6.65 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.80 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7	
_	Atlanta, Ga.												
SOUTH	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2,R3	\$10.50 T2	\$9.20 T2	
	Houston, Texas			1	1				1	6.65 S2			

	STEEL			BA	RS				PLAT	ΓES		WIRE
F	PRICES	Carbon† Steel	Reinforc- ing	Cald Finished	Ailoy Het- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conshohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7		_							
	Hartford, Conn.			8.15 R3		9.325 R3						
EAST	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
E	Fairless, Pa.	5.825 UI	5.825 UI		6.875 UI							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.89 N8	9.175 N8			1			
	Sperrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Roadville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
_	Alton, III.	5.875 L/										8.20 <i>L1</i>
	Ashland, Newport, Ky.							5.30 A7, A9		7.50 A9	7.95 A7	
	Canton, Massillon,	6.15° R3		7.65 R3,R2	6.725 R3	9.025 R3,R2 8.775 T5		5.30 E2				
	Mansfield, Ohio Chicago, Joliet, Waukegan,	5.675 UI, R3, W8,N4,P13	5.675 UI, R3, N4, P13, W8	7.65 A5, W10,W8,	6.475 T5 6.725 U1,R3, W8	9.025 A5, W10,W8,	8.30 U1,W8, R3	5.30 UI, AI, W8, I3	6.375 UI	7.50 UI, W8	7.95 UI, W8	8.00 A5,R W8,N4,
	Waukegan, Madison, Harvey, III. Cleveland, Ohio	5.675 R3	5.875 <i>L1</i> 5.675 <i>R3</i>	7.65 A5,C13,		9.025 A5, C13,C18	8.30 R3	5.30 R3, J3	6.375 J3		7.95 R3,J3	K2,W7 8.00 A5, C13,C18
	Elyria, Ohio	5.675 G3	5.675.C2	C/8 7.90 P3	6.725 R5,G3	9.025 R5	8.30 G3	5.30 G3		7.50 G3	7.95 G3	C13,C18
	Detroit, Mich.	3.6/3 (3)	5.675 G3	7.85 P8,B5 7.65 R5	1	9.225 B5, P3, P8		230 07		1.30 07	1.3005	
	Duluth, Minn.											8.00 A5
WEST	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,13, Y1	5.675 U1,13, Y1	7.65 R3,J3	6.725 U1,13, Y1	9.025 R3,M4	8.30 UI, YI	5.30 U1,13, Y1	6.375 <i>J</i> 3,	7.50 UI, YI	7.95 UI, YI,13	8.10 M4
MIDDLE	Granite City, III.							5.40 G2				
MID	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, III.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C/O,	9.925 C10		5.30 R3,S1		7.50 SI	7.95 R3, S1	
	Owensbere, Ky.	5.675 G5			6.725 G5							
	Pittaburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 UI, J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1, J3, C11, B7	9.825 A5, W10,R3,S9, C11,C8,M9	8.30 UI,J3	5.30 UI, J3	6.375 UI _J3	7.50 UI, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Pertsmouth, Ohio											8.00 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.30 W5				
	Youngstown, Ohio	5.675 UI, R3, YI	5.675 U1, R3, Y1	7.65 AI, YI, F2	6.725 UI, YI	9.825 YI,F2	8.30 UI, YI	5.30 UI, R3, Y1		7.50 YI	7.95 UI, YI	8.00 Y/
	Emeryville, Cal. Fentana, Cal.	6.425 <i>JS</i> 6.375 <i>KI</i>	6.425 /5 6.375 K/		7.778 <i>KI</i>		9.00 KI	6.10 <i>KI</i>		8.30 KI	8.75 <i>K1</i>	
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 SZ		8.55 S2					8.25 52
WEST	Los Angeles, Terrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
W	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 02	6.425 02				11 11					
	San Francisco, Nilos, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7,C
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2	
	Atlanta, Ga.	5.875 A8	5.675 A8									8.00 48
SOUTH	Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C/6			8.30 72	5.30 T2,R3			7.95 T2	8.00 T2,R
93	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 52		8.55 S2	5.40 S2		7.60 52	8.85 SZ	8.25 52

[†] Merchant Quality—Special Quality 35¢ higher. (Effective Feb. 9, 1959)
THE IRON AGE, February 12, 1959

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STEEL PRICES

Key to Steel Producers

With Principal Offices

- Al Acme Steel Co., Chicago
- Alan Wood Steel Co., Conshohocken, Pa.
- Allegheny Ludlum Steel Corp., Pittaburgh
- 44 American Cladmetals Co., Carnegie, Pa.
- American Steel & Wire Div., Cleveland 15
- Angel Nail & Chaplet Co., Cleveland
- A7 Armco Steel Corp., Middletown, Ohio
- 48 Atlantic Steel Co., Atlanta, Ga.
- 49 Acme-Newport Steel Co., Newport, Ky.
- BI Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- B2 Bethlehem Pacific Coast Steel Corp., San Francisco
- Bethlehem Steel Co., Bethlehem, Pa. B3
- Blair Strip Steel Co., New Castle, Pa. 25 Bliss & Laughlin, Inc., Harvey, Ill.
- B6
- Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
- B7 A. M. Byers, Pittsburgh
- B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
- CI Calstrip Steel Corp., Los Angeles
- Carpenter Steel Co., Reading, Pa.
- Claymont Products Dept., Claymont, Del. C6
- Colorado Fuel & Iron Corp., Denver C7
- Columbia Geneva Steel Div., San Francisco C8
- Columbia Steel & Shafting Co., Pittsburgh
- Continental Steel Corp., Kokomo, Ind. C10 Copperweld Steel Co., Pittsburgh, Pa.
- C11 Crucible Steel Co. of America, Pittsburgh
- Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shafting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
- D1 Detroit Steel Corp., Detroit
- D2 Driver Co., Newark, N. J.
- D3 Driver Harris Co., Harrison, N. I.
- D4 Dickson Weatherproof Nail Co., Evanston, Ill.
- El Eastern Stainless Steel Corp., Baltimore
- E2 Empire-Reeves Steel Corp., Mansfield, O.
- E3 Enamel Products & Plating Co., McKeesport, Pa.
- Firth Sterling, Inc., McKeesport, Pa.
- Fitzsimons Steel Carp., Youngstown
- F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, III.
- G3 Great Lakes Steel Corp., Detroit Greer Steel Co., Dover, O. G4
- G5 Green River Steel Corp., Owenboro, Ky.
- HI Hanna Furnace Corp., Detroit
- 12 Ingersoll Steel Div., Chicago
- 13 Inland Steel Co., Chicago
- 14 Interlake Iron Corp., Cleveland
- JI Jackson Iron & Steel Co., Jackson, O.
- Jessop Steel Corp., Washington, Pa.
 Jones & Laughlin Steel Corp., Pittsburgh
- Joslyn Mfg. & Supply Co., Chicago
- J5 Judson Steel Corp., Emeryville, Calif. KI Kaiser Steel Corp., Fontana, Calif.
- K2 Keystone Steel & Wire Co., Peoria
- K3 Koppers Co., Granite City, Ill.
- K4 Keystone Drawn Steel Co., Spring City, Pa.
- LI Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- L3 Lone Star Steel Co., Dallas L4 Lukens Steel Co., Coatesville, Pa.
- MI Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
- M6 Mystic Iron Works, Everett, Mass.
- M7 Milton Steel Products Div., Milton, Pa.
- M8 Mill Strip Products Co., Evanston, Ill.
- M9 Moltrup Steel Products Co., Beaver Falls, Pa.
- NI National Supply Co., Pittsburgh
- N2 National Tube Div., Pittsburgh N4 Northwestern Steel & Wire Co., Sterling, Ill.
- N6 Northwest Steel Rolling Mills, Seattle
- N7 Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
- N9 Nelson Steel & Wire Co.
- 01 Oliver Iron & Steel Co., Pittsburgh
- 02 Oregon Steel Mills, Portland
- P1 Page Steel & Wire Div., Monessen, Pa.
- P2 Phoenix Steel Corp., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P4 Pittsburgh Coke & Chemical Co., Pittsburgh
- P5 Pittsburgh Screw & Bolt Co., Pittsburgh Pittsburgh Steel Co., Pittsburgh
- P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit
- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J. P11 Production Steel Strip Corp., Detroit
- P13 Phoenix Mfg. Co., Joliet, Ill.
- P14 Pacific Tube Co.
- P15 Philadelphia Steel and Wire Corp.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland
- R4 Roebling Sons Co., John A., Trenton, N. J.
- R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
- R6 Rodney Metals, Inc., New Bedford, Mass.
- R7 Rome Strip Steel Co., Rome, N. Y.
- SI Sharon Steel Corp., Sharon, Pa.
- S2 Sheffield Steel Div., Kansas City S3 Shenango Furnace Co., Pittsburgh
- S4 Simonds Saw and Steel Co., Fitchburg, Mass.
- \$5 Sweet's Steel Co., Williamsport, Pa.
- S7 Stanley Works, New Britain, Conn.
- S8 Superior Drawn Steel Co., Monaca, Pa.
- 59 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
- S10 Seneca Steel Service, Buffalo
- S11 Southern Electric Steel Co., Birmingham
- S12 Sierra Drawn Steel Corp., Los Angeles, Calif. 71 Tonawanda Iron Div., N. Tonawanda, N. Y.
- 72 Tennessee Coal & Iron Div., Fairfield
- 73 Tennessee Products & Chem. Corp., Nashville
- 74 Thomas Strip Div., Warren, O.
- 75 Timken Steel & Tube Div., Canton, O.
 77 Texas Steel Co., Fort Worth
- 78 Thompson Wire Co., Boston
- UI United States Steel Corp., Pittsburgh
- U? Universal-Cyclops Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- W/ Wallingford Steel Co., Wallingford, Conn.
- W2 Washington Steel Corp., Washington, Pa. W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo
- W7 Wilson Steel & Wire Co., Chicago.
- W8 Wisconsin Steel Div., S. Chicago, Ill.
- 19 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh W12 Wallace Barnes Steel Div., Bristol, Conn.
- YI Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TURING

Base discounts (pct) f.o.b. mills. Base price about \$200 per net ton.

							BUTT	WELD										SEAN	ALESS			
	1/2	in.	34	ln.	11	ln.	11/4	in.	11/2	ln.	2	ln.	21/2	3 In.	2	ln.	23/	i in.	3	ia.	31/4-	4 In.
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.
Sparrows Pt. B3 Youngstown R3 Footana K1	0.25 2.25 *10.75	*15.0 *13.0 *26.00	3.25 5.25 *7.75	*11.0	6.75 8.75 *4.25	*4.50	9.25	+5.75 +3.75 +16.75	11.75		12.25		13.75									
Pittsburgh J3	2.25 0.25 2.25	*13.0 *15.0 *13.0	5.25 3.25 5.25	*9.0 *11.0 *9.0	8.75 6.75 8.75		9.25 11.25	+3.75 +5.75 +3.75	11.75	+2.75 +4.75 +2.75	12.25 10.25		13.75 11.75 13.75	+2.50 +4.50 +2.50	+12.25	*27.25	+5.75	+22.50	*3.25	*20.0	*1.75	*18.5
Fairless N2. Pittsburgh N1. Wheeling W5.	0.25	*15.0 *13.0 *13.0	3.25 5.25 5.25	*11.0 *9.0	6.75 8.75 8.75	*6.50 *4.50	9.25 11.25 11.25	+5.75 +3.75 +3.75	9.75 11.75 11.75	+4.75	10.25	*4.25 *2.25 *2.25	11.75	+4.50 +2.50 +2.50	+12.25	+27.25	+5.75	+22.58	*3.25	*20.0	*1.75	+18.5
Wheatland W4 Youngstown YI	2.25 2.25 1.25	*13.0 *13.0 *14.0	5.25 5.25 4.25	*9.0 *9.0	8.75 8.75 7.75	*4.50 *4.50	11.25 11.25 10.25	*3.75 *3.75 *4.75	11.75	+2.75	12.25	+2.25 +2.25 +3.25	13.75 13.75	49 50	*12.25	*27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.5
Lorain N2	2.25		5.25	*9.0	8.75		11.25								*12.25	+27.25	+5.75	+22.50	+3.25	*20.0	+1.75	*18.5
PLAIN ENDS Sparrows Pt. B3 Youngstown R3	4.75	*9.0	8.75 10.75	*5.0	11.75 13.75		12.25															
Fairless N2	4.75	*9.0	8.75 +2.25	+5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	+1.50					*0.75			
Pittsburgh J3	6.75 4.75 6.75	*7.0 *9.0 *7.0	10.75 8.75 10.75	*3.0 *5.0 *3.0	13.75 11.75 13.75		14.25 12.25 14.25		12.75		13.25		13.75						*8.75			*11.5
Pittsburgh N1	6.75	*7.8 *7.8 *7.0	10.75 10.75 10.75	*3.0 *3.0	13.75 13.75 13.75	1.50 1.50 1.50	14.25	0.25	14.75		15.25 15.25	1.75	15.75 15.75	0.50 0.50	*10.75	+24.75	*3.2	5 *19.0	*0.75	+16.50	4.25	*11.5
Youngstown Y/	6.75 5.75	*7.0 *8.0	10.75	*3.0	13.75	1.50 0.50	14.25 13.25	0.25 *0.75	14.75	1.25 0.25	15.25 14.25	1.75	15.75 14.75	0.50 *0.50	*10.75				*0.75			
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.2	*19.6	*8.75	*16.50	4.25	*11.

Threads only, buttweld and seamless, 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in., 1½, pt.; 2½ and 3-in., 1 pt., e., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; ninc price in range over 7¢ to 9¢ would increase discounts. East St. Louis sinc price new 11.58¢ use lb.

TOOL STEEL

F.o.b.				-	**	0.4.73
W	Cr	V	Mo	Co	per lb	SAE
18	4	1	_	-	\$1.84	T-1
18	4	1	-	5	2.545	T-4
18	4	2	-	-	2.005	T-2
1.5	4	1.5	8	-	1.20	M-1
6	4	3	6	-	1.59	M-3
6	4	2	5		1.345	M-2
High-	carbo	n chr	omiu	m	.955 D	-3, D-5
Oil ha	rden	ed ma	ngan	989	.505	0-2
Specia	al car	rbon			.38	W-1
Extra	cart	on .			.38	W-1
Regul					.325	W-1
Wa	rehou	se pr	ices o	n and	east of l	Missis-
sippi sissip	are 4	¢ per	lb h			

CLAD STE	EL	Base pri	ces, cent	s per lb f.o.b.
	Plate	(L4, C4,	43, J2)	Sheet (12)
Cladding	10 pct	15 pct	20 pct	20 pct
202				27 50

		10 br	10 pc		Pro
	302				37.50
	384	28.80	31.55	34.30	40.00
2	316	42.20	46.25	50.25	58.75
Stanless 19p	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
n	405	24.60	26.90	29.25	
	410	22.70	24.85	27.00	
	430	23.45	25.65	27.90	*****

CR Strip (S9) Copper, 10 pct, 2 sides, 42.05; 1 side, 35.55.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer UI	5.75	6. 725	7.25			
Cleveland R3						15.35
Se. Chicago R3				10.10		
So. Chicago R3 Ensley 72	5.75	6.725				
Fairfield T2		6.725		10.10	6.875	
Gary 1/1	5.75	1			6.875	
nd. Harbor /3				10.10		
Ind. Harbor 13 Johnstown B3		6.725				
Joliet UI	1		7.25			
Kansas City S2.	1			10.16		15.35
Luckawanna B3	5.75	6.725	7.25		6.875	
Lebanon B3 Minnequa C6			7.25			15.35
Minneaua Co	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh P5						14.75
Pittaburgh 13		1		10.10		
Seattle B2					6.75	15.85
Steelton B3	5.75		7.25		6.875	
Struthers Y1				10.10		
Torrance C7	1	1		1	6.75	
Williamsport S5 Youngstown R3		6.725				
Youngstown R3				10.10		

CONC	
Furnace, beehive (f.o.b.) Connellsville, Pa\$14.50 to	Net-Ton 0 \$15.50
Foundry, beehive (f.o.b.)	.\$18.50
Foundry oven coke	
Buffalo, del'd	. \$33.25
Detroit f.o.b.	. 32.00
New England, del'd	. 33.55
Kearney, N. J., f.o.b.	. 31.25
Philadelphia, f.o.b.	. 31.00
Swedeland, Pa., f.o.b	. 31.00
Painesville, Ohio, f.o.b.	. 34.35
Erie, Pa., f.o.b	. 32.00
Cleveland, del'd	. 34.19
Cincinnati, del'd	. 32.84
St. Paul, f.o.b	. 31.25
St. Louis, f.o.b	. 33,00
Birmingham, f.o.b.	. 30.35
Milwaukee, f.o.b.	
Neville Is., Pa	. 30.75

LAKE SUPERIOR ORES

51.50% Fe lower Lake	ports.	Pri	cea	1	or	21	151	season.
Freight ch	anges	10		ac	1440	7		tross Ton
Openhearth	lump							
Old range,								
Old range, 1								
Mesabi, besi								
Mesabi, non								
High phosph	RUTOS							11.45

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cold-Reduced (Coiled or Cut Length)						
F.o.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed					
Field	11.70	9.875	11.70					
Elect	12.40	11.90	12.40					
Special Motor	22122	12.475	14.75					
Motor	13.55	13.05	13.55					
Dynamo Trana. 72	14.65	15.20	15.70					
Trans. 65	16.30	Grain (Oriented					
Trans. 58	16.80	Trans. 80						
Trans. 52	17.85	Trans. 73 Trans. 66						

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbar (A3); Manafield (E2); Newport, Ky. (A9); Nilea, O. (SI); Vandergrift (UI); Warren, O. (R3); Zanasville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

(GRAPHITE		CARBON*								
Diam. (In.)			Diam. (ln.)	Length (In.)	Price						
24 20 18 14 12 10 10 7 6 4 3 21/2 2	84 72 72 72 72 72 60 45 60 40 40 40 38 24	27.25 26.50 27.50 27.25 28.25 29.50 30.00 29.75 33.25 37.00 39.25 41.50 64.00	40 35 38 24 20 17 14 10 8	100, 110 110 110 72 90 72 72 72 60 60	12.50 11.20 11.70 11.95 11.55 12.10 12.55 13.80 14.25						

* Prices shown cover carbon nipples.

REFRACTORIES

Eiro Clay Brick

Carloads	per 1000
Super duty, Mo., Pa., Md., Ky	
High duty (except Salina, Pa.,	
add \$5.00)	
Medium duty	125.00
Low duty (except Salina, Pa.,	
add \$2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Mt. Union, Pa., Ensley, Ala.\$158.00

Silica Brick

Childs, Hays, Latrobe, Pa	63.00
Chicago District 1	68.00
Western Utah 1	83.00
California 1	
Super Duty	.00.00
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O., Morrisville	
	00 00
163.00-1	68.00
Silica cement, net ton, bulk, Latrobe	29.78
Silica cement, net ton, bulk, Chi-	
cago	26.75
	20.10
Silica cement, net ton, bulk, Ens-	
ley, Ala.	27.75
Silica cement, net ton, bulk, Mt.	
Union	25.71
Silica cement, net ton, bulk, Utah	
and Calif.	39.00
mild Chills	

Chrome	Bric	k													Į	3	91	P	92	et	ton
Standard Standard	che	m	ic	a	1	ly	7	1	ж	01	ne	d	84	đ.	(3	u	r	1-		
iner, C	alif.																			11	9.00
Burned,	Balt	4		9		0	9												- 0	10	3.00

Standard,							
Chemically	bonded,	Balt	imore	0	0	0	. 119.0

Grain Ma	gnesi	te	St.	%	to	1/4-in.	grains
Domestic,							\$73.00
Domestic,		Ch	ewa.	lah,	M	ash.,	
Luning.	Nev.						

in	bulk																					4	6.	0
in	sacks		0			0	0	0	0	0	0		9	a	0			5	2	.0	0-	5	4.	0
Dead	Burn	e	d	D	10	si	le		n	H	h					1	D,		•		1.01	ě	*	a

Dean Dell		-	***	••	-							38		MC 0 81	210
F.o.b. bulk	, pro	duc	in	g	D	0	in	te	8	ħ	n				
Pa., W.	Va.,	Oh	to		0 0								0	\$16.	
Missouri	Vall	ey							9					15.	00
Midwest						0	0						0	17.	00

(Effective Feb. 9, 1959)

MERCHANT WIRE PRODUCTS

	Standard Q Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
F.o.b. Mill	Col	Cal	Cel	Col	Cal	¢/lb.	¢/lb.
Alabama City R3	173	187		212	193		9.55
Ali quippa J3***	173	190					9.675
Ali quippa 13*** Atl anta 48**	175	192		214	198		9.425
Bartonville K2°*.	175	192		214			9.775
Buffalo W6							9.55*
Chicago N4*** Chicago R3	173	190	172		196		9.325
Chicago R3						9.00	9.55
Cleveland 46						1	
Cleveland 45							
Cleveland A5 Crawf day. M4**	175	192		214	198	9.10	9.775
Donora, Pa. A5	173	187			193	9.00	9.55
Duluth 45	173	187		212	193	9.00	9.55
Fairfield, Ala. 72	173	187		212	193	9 00	9.55
Galveston D4	9.101						
Houston S2	178	192			198		9.801
Jacksonville M4.	184-1	197			203		9.775
Johnstown B3**.	173	190			196		9.675
Joliet, III. 45	173	187			193		9.55
Kokomo C9	175	189			195"		9.65"
L. Angeles B2***		100					10.625
Kansas City S2°.	179	192			198"	9 25	9.881
Minnegua C6	178	192			1981	9.25	
Monessen P6	110	194		64.			9.325
Pal mer, Mass. W6					193		9.85
Pal mer, Nass. Wo	103	210			919		10.1:
Pittsburg, Cal. C/	172	107			193		9.55
Pittaburg, Cal. C7 Rankin, Pa. A5 So. Chicago R3	173	107			193		9.20
	1/3	101		***	133	0.95	10.501
S. San Fran. C6				234	100	9.93	9.775
SparrowsPt.B3**	1/5			614	138	9.10	3.115
Struthers, O. YI's						5. 63	9.20
Worcester A5							
Williamsport S5.				1 6 8			

*Zinc less than .10¢. ... † Plus zinc extras. † Wholesalers only.

C-R SPRING STEEL

		CARBON CONTENT										
Cents Per Lb F.o.b. Mill		0.41- 0.60		0.81- 1.05	1.06-							
Anderson, Ind. Gt		10.40		15.60	18.55							
Baltimore, Md. T8		10.70		15.90	18.85							
Bristol, Conn. W/2	1 2 22	10.70	12.90	16.10	19.30							
Boston T8			12.90	15.90								
Buffalo, N. Y. R7			12.68	15.60								
Carnegie, Pa. S9			12.60	15.60								
Cleveland A5			12.60	15.60	18.55							
Dearborn S1			12.70	15.70								
Detroit D1			12.70									
Detroit D2	. 9.03		12.70	45.00	10 0							
Dover, O. G4	. 8.95		12.60	15.60								
Evanston, Ill. M8			12.60									
Franklin Park, Ill. 78.			12.60		18.55							
Harrison, N. J. Cll		122.00		16.10	19.34							
Indianapolis R5			12.60	15.60	18.55							
Los Angeles Cl			14.80	17.80								
New Britain, Conn. 57.			12.90		18.8							
New Castle, Pa. B4	8.95		12.60									
New Haven, Conn. D/			12.90									
Pawtucket, R. I. N7	. 9.50		12.90		18.8							
Riverdale, Ill. Ai			12.60		18.5							
Sharon, Pa. Sl			12.60									
Treaten, Rf			12.90									
Wallingford W1	. 9.4		12.98									
Warren, Ohio T4			12.60									
Worcester, Mass. A5			12.90									
Youngstown R5	. 9.10	10.5	12.60	15.60	18.5							

BOILER TURES

\$ per 100 ft, carload lots	Si	ze	Sean	nless	Elec. Wold
cut 10 to 24 ft. F.s.b. Mill	OD- in.	B.W. Gr.	H.R.	C.D.	H.R.
Babceck & Wilcex	2 21/2 3 31/2 4	13 12 12 11 10	40.28 54.23 62.62 73.11 97.08	63.57	35.22 47.43 54.77 63.93 85.53
National Tube	2 21/2 3 31/2 4	13 12 12 11 11 10	40.28 54.23 62.62 73.11 97.08		35.22 47.43 54.77 63.93 85.53
Pittaburgh Steel	2 21/2 3 31/2 4	13 12 12 11 11	40.28 54.23 62.62 73.11 97.08	63.57 73.40	

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Compacting rowders	
Electrolytic, imported, f.o.b. 29.50 t Electrolytic, domestic Sponge Atomized Hydrogen Reduced 11.25 t Carbonyl	34.50 11.25 11.25
Welding Powders*	8.10
Cutting and Scarfing Dowders	9 10

Copper Powders

Electrolytic, domestic Precipitated	41.00 40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.,	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	\$5.00
Lead	19.00
Management of a least	42.00
Manganese, f.o.b.	
	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.03
Nickel Silver	
Nickel Steel	
Solder	
	\$1.07
Citatiness Steel, SV2	81.04
Stainless Steel, 316	\$1.26
Steel, atomized, prealloyed,	
4600 series14.00 plu	s metal value
Tin14¢ plu	
Titanium, 99.25 + %, per lb.,	
f.o.b	\$11.25
Tunouton #91	E (nominal)
Tungsten\$3.1	o (nominal)

^{*} F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Bolts	1-4 Con- tainers	5 Con- tainers	20,000 Lb.	40,000 Lb.
Machine				
3/2" and smaller x 3" and shorter 5/3" diam. x 3" and	55	57	61	62
shorter	47	4936	54	55
%" thru 1" diam x 6" and shorter %" thru 1" diam. longer than 6" and	37	391/2	45	46
11/4" and larger x all lengths Rolled thread, 1/4"	31	34	40	41
and smaller x 3" and shorter Carriage, lag, plow, tap, blank, step, elevator and fitting	55	57	61	62
up bolts 1/2" and smaller x 6" and shorter	48	5034	55	58

Distributor prices are 5 pet less on bolts and square nuts.

Nuts,	Hex, HP	reg. &	hvy.	case or
% in.	or small to 11/2 in	er		 . 62
1 5% in	and lar	POP		E1 14

C.	P.	Hex, reg.	& hvy.	
34	in.	or smaller		62
7/8	in.	to 11/2 in.	inclusive	56

1% in. and	larger				51
Hot Galv.	Hex No	its (All T	ypes)	
% in. and	smaller				41

Semi-finished Hex Nuts	
34 in. or smaller	62
% in. to 1½ in. inclusive	56
	513
(Add 25 pct for broken case or quantities)	keg

Finished

78 m. and smaner 00	
Rivets Base per 100 lb	
½ in. and larger	
7/16 in. and smaller 15	

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat
aged

%" diam. and smaller x 6" and shorter	54	42
%", %", and 1" diam. x 6" and shorter %" diam. and smaller x	38	23
longer than 6" X		0 0
longer than 6"	Fu	1018 Stee

14" through 16" dia. x 6"	4.0
and shorter 59	48
%" through 1" dia. x 6" and shorter 45	32
Minimum quantity-14" thr	ough %"
Minimum quantity-4" thr diam., 15,000 pieces; 7/16" th	rough %"
diam., 5,000 pieces; %" through	1" diam.,
2,000 pieces.	

Machine Screws & Stove Bolts

		Disco	ount
Plain Finis Cartons Bulk	h Quantity	Mach. Screws 60	Stove Bolts 60
To ¾" diam.	25,000-and over	r 60	0 0
5/16 to 1/4" diam.	15,000-200,000	60	0 0

Machine So	rews & Stove	Bolt N	luts
		Dis	count
In Cartons	Quantity	16	Square 19
In Bulk %" diam. &	}25,000-and over	r 15	16
smaller			

ELECTROPLATING SUPPLIES

Anodes

Copper	per to, j	rt allow	cu en q	munitary)
5000	lb lots .	l, 18 in.		45.00
Brass, 8 or mor	e			47.50
Zinc, bal (fo Nickel,	or ellipti	cal add	1¢ per	lb)
5000 l (Roll	ed depol	arized a	id 3¢ p	1.0220 er lb)
Cadmiun Tin, ball	anodes	\$1.05 per	lb (a)	1.48 prox.).

			C	hemi	cals	5			
Cer	nts	per	lb,	1.0.	. sh	ippi	ig	poin	11)
er	SU	lpha	ite.	100	lb	bag	S,	per	65.90
el	sal	ts. s	ing	le, 1	00 11	b bar	gs.		22.75 36.00

Coppe

CWL	22.10
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed,	
100 lb	45.00
Sodium cyanide, domestic, f.o.b.	
N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	
N. Y	45.50
Chromic acid, flake type, 10,000 lb	
or more	30.44

CAST IRON WATER PIPE INDEX

-				ш		,		-	-		-			•	۰	*	٠		-		•		••		
Birmin	g	hai	m						٠					0		0		0	0		0		1	25	.8
New Y	0	rk				0									0					۰			1	38.	G,
Chicag	0														0			0	0	٥			1	40	.9
San F	ra	inc	180	20	-	L,		A				0	0	0	0			0	0	0		0	1	48	.6
5 in. o	rio	la n:	rg	e1	,	5	ei	ll	8	ai le	pi		8	P	1	g	0	t I 9	2	34	ip	e	10	Es	6.
	Birmin New Y Chicag San F Dec. 5 in. o	Birming New Yo Chicago San Fra Dec. 5 in. or planatio	Birminghan New York Chicago San Franc Dec. 198 5 in. or la planation:	Birmingham New York Chicago San Francisc Dec. 1955, 5 in. or larg planation:	Birmingham New York Chicago San Francisco Dec. 1955, 5 in. or larger planation: p.	Birmingham New York Chicago San Francisco-Dec. 1955, v 5 in. or larger, planation: p.	Birmingham New York Chicago San Francisco-L. Dec. 1955, val 5 in. or larger, b planation: p. 5	Birmingham New York Chicago San Francisco-L. Dec. 1955, value 5 in. or larger, bei planation: p. 57,	Birmingham New York Chicago San Francisco-L. A Dec. 1955, value 5 in. or larger, bell planation: p. 57,	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, 5 in. or larger, bell e planation: p. 57, 8	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, 6 5 in. or larger, bell an planation: p. 57, 8e	Birmingham	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Clastin. or larger, bell and planation: p. 57, Sept.	Birmingham	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class 5 in. or larger, bell and sp planation: p. 57, Sept. 1	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class 5 in. or larger, bell and spi planation: p. 57, Sept. 1,	Birmingham	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B 5 in. or larger, bell and spigo- planation: p. 57, Sept. 1,	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B of 5 in. or larger, bell and spigot planation: p. 57, Sept. 1, 18	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B of 5 in. or larger, bell and spigot planation: p. 57, Sept. 1, 19	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B or 5 in. or larger, bell and spigot prlanation: p. 57, Sept. 1, 195;	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B or 5 in. or larger, bell and spigot pip planation: p. 57, Sept. 1, 1955,	Birmingham New York Chicago San Francisco-L. A. Dec. 1955, value, Class B or h 5 in. or larger, bell and spigot pipe planation: p. 57, Sept. 1, 1955,	Birmingham	Birmingham 125 New York 138 Chicago 140 San Francisco-L A 148 Dec. 1955, value, Class B or heavistin. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, isau Source: U.S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100	a.

PIEER SEKA	CE	CEN	I EK3					Metro	politan F	rice, dol	lars per	100 lb.
Cities		Sheets		Strip	Plates	Shapes	Ba	rs		Alloy	Bara	
City Delivery t	Het-Rolled (18 ga. & bvr.)	Cald-Ralled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard	Het-Relled (merchant)	Cold. Finished	Het-Rolled 4615 As rolled	Hat-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140
Atlanta	8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*				
Baltimore 3.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham	8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Baston	9.41	10.50	12.07	9.84	10.12	10.11	10.21	13.45*	16.79	15.79	20.29	19.56
Buffalo	8.40	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	8.40	9.60	11.05	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati15	8.58	9.65	10.70	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland 15	8.51	9.69	11.51	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.86
Denver	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19		******		20.84
Detroit	8.66	9.85	11.40	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston	8.10	8.60		8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		11.20-	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis15	8.55	11.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee 15	8.54	9.73	11.19	8.80	9.13	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York 10	9.27	10.59	11.20	9.74	9.87	9.84	10.09	13.35°		15.60	20.10	19.35
Norfolk20	8.20			8.90	8.65	9.20	8.90	10.70		1188211		
Philadelphia 10	8,39	9.35	10.44	9.35	9.25	9.20	9.50	12.05°		15.58	20.08	19.33
Pittsburgh15	8.50-		11.05	8.76	9.85	9.15	9.14	11.40		15.20	19.70	18.95
Portland	8.60	9.95 11.75 ²	13.303	11.954	11.505		9.857	15.30		17.45	20.75	20.25
San Francisco 10		11.20	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		11.55	12.45	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Seekane	10.10		12.60	10.65	9.85	9.95	10.75	14.85	17.75	16.95	21.55	20.75
St. Louis	8.78	9.98	11.43	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
						9.53	9.707	10.16		15.41	-	19.21
St. Paul	8.94	10.19	11.64	8.99	9.45	3.33	9.10	10.10		10.41		19.21

Base Quantities (Standard unless otherwise keyed); Cold finished bars; 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. "All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. *C1018—1 in. rounds. ¹ 10 ga. x 36" x 120";
20 ga. x 36" x 120"; ² 26 ga. x 30" x 96"; ⁴ 4½" x 1" in lots of 1000 to 9999; ¹ 5 sheared plate
½" x 84" in lots of 1000 to 9999; ° 3" x 5.70" in lots of 1000 to 9999; ° M-1020—1-in. rounds in lots of 1000 to 9999; ° 15 ga. & heavier.

Producing Point	Basic	Fdry.	Mall.	Bezz.	Low Phos.
tirdsbero, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50°			
Birmingham W9	62.00	62.50°	66.50		
Birmingham U4	62.00	62.50°	66.50		
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo HI	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Chicago 14	66.00	66,50	66,50	67.00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00
Cleveland R3	66.00	66.50	66,50	67.00	
Duluth 14	66.00	66,50	66,50	67.00	71.00
Erin 14	66.00	66.50	66,50	67.00	71.00
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Geneva, Utah C7.	66.00	66.50			
Granite City G2	67.99	68,40	68.90		
Hubbard Y/			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minnegua Có	68.00	68.50	69.00		
Manassen P6	66.00				
Naville Is. P4	66.00	66.50	66.50	67.00	71.00
N. Tonawanda Th		66.50	67.00	67.50	
Sharnaville S3	66.00		66.50	67.00	
So. Chicago R3	66.00	66,50	66.50	67.00	
Sa. Chicago W8	66.00		66.50	67.00	
Swedeland A2	68.00	68.50	69.00	69.50	
Teledo /4	66.00	66.50	66.50	67.00	
Trey, N. Y. R3	68.00	68.50	69.00	69.50	73.00
Yeopratown YI.	40.00	00:00	66.50	05.00	13.00

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct excep tew phos., 1.75 to 2.09 pct) 30¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, 32 per ton for 0.86 to 0.75 pct nickel, 31 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

Add \$1.00 for 0.31-0.69 pct phos.
Silvery Irem: Buffalo (6 pct), H./, 379.25; Jackson //, 14
(Globe Div.), \$78.00; Nisgara Falla (15.01-15.50), \$101.00;
Kookuk (1.01-14.50), \$105.50; (15.51-16.00), \$106.50
Add \$1.00 per ion for each 0.50 pct silicon over base (6.01
to 6.50 pct) up to 18 pct. Add \$12.50 or sach 0.50 pct mammanes over 1.00 pct.
Beasemer silvery pig iron (under .10
pct phos.); \$64.00. Add \$1.00 premium for all grades
silvery to 18 pct.

† Intermediate low phos.

Product	201	202	301	382	303	304	316	321	347	403	410	416	430
Ingota, recoll.	22.75	24.75	24.00	26.25	-	28.00	41.25	33.50	38.50	-	17.50	-	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	-	22.25	-	22.50
Billets, forging	-	37.75	38.75	39.50	42.50	42.00	64.50	48.75	\$7.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	-	44.25	69.25	53.50	63.50	-	31.00	-	32.66
trip, cald-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Vire CF; Red HR		42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., 12; Detroit, M2; Louisville, O., R5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Detroit, S1; Canton, Massillon, O., K3; Harrison, N. J., D3; Youngstown, R5; Sharon, Pa., S1; Butler, Pa., A1; Willingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Carry, U1 (25¢ per lb. higher)

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervillet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owenshoro, Ky., G5; Bridgeport, Conn., N8.

Wire: Waukegan, A5; Massillon, O., R5; McKeesport, Pa., F1; Ft. Wayne, J4; Newark, N. J. D2; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, UI.

Plates: Baltimore, E1; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., 12; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergriit, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G3; Bridgeport, Conn., N8.

(Effective Feb. 9, 1959)



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T-BOLTS & BOLSTER BOLTS ALLOY STEEL 150,000 LBS. TENSILE STRENGTH T-Bolts-1/2", 5%", 34", 1/8", 1" Body Diameters Bolster Bolts to J.I.C. Standards

Special bolts available to 1 ½" body diameter and 3" Square Head. All bolts except ½" and ¾". available with Hexagon Heads . . . Hardened Nuts and Ground Washers available for all size bolts.

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FERROALLOY PRICES

Ferrochrome	Spiegeleisen	Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y.,
Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Sl.	Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa. Manganese Silicon	per lb. Carloads, bulk 9.85¢ Ton lots
0.02% C 41.00 0.50% C 38.00 0.05% C 39.00 1.00% C 37.75 0.10% C . 38.50 1.50% C 37.50 0.20% C 38.55 2.00% C 37.25 4.00-4.50% C, 6.070% Cr, 1.2% S1. 28.76 3.59-5.00% C, 57-64% Cr, 2.00-4.50% 28.25	16 to 19% 3% max\$100.50 19 to 21% 3% max	Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo
4.00-4.50% C, 60-70% Cr, 1-2% Sl. 28.75 3.59-5.00% C, 57-64% Cr, 2.00-4.50% Sl. 28.25	Manganese Metal 2 in. x down, cents per pound of metal	Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound con-
8% max C, 50-55% Cr, 6% max Si. 25.75	delivered. 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	tained Cb. Ton lots
Si	Carload, packed	Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton
Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome	Electrolytic Manganese F.o.b. Knoxville, Tenn., freight allowed	lots, 2-ln. x D per lb con't Cb plus Ta
max. 0.10% C price schedule. Chromium Metal	F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. Carloads	Pa., per pound contained Mo \$1.76
Per 1b chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe. 0.10% max. C	Carloads 34.00 Ton lots 36.00 250 to 1999 ib 38.00 Premium for Hydrogen - removed metal 0.75	Ferrophosphorus, electric, 23- 26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.60 unitage, per gross ton\$120.00 10 tons to less carload\$131.00
Electrolytic Chromium Metal	Medium Carbon Ferromanganese	Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots,
Per lb of metal 2" x D plate (\(\frac{1}{2}\)" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	per in contained Ti #1.00
Carloads \$1.15 Ton lots 1.17 Less ton lots 1.19	Low-Carb Ferromanganese Cents per pound Mn contained lump	Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots,
Low Carbon Ferrochrome Silicon (Cr 39-41%, Si 42-45%, C 0.05% max.)	Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%. Carloads Ton Loss 0.07% max. C, 0.06% (Bulk)	Less ton lots \$1.54
Carloads, delivered, lump, 3-in. x down, packed. Price is sum of contained Cr and contained Si.	P, 90% Mn 37.15 39.95 41.15 0.07% max. C 35.10 37.90 39.10 0.10% max. C 34.35 37.15 38.35	Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, car-
Cr Si Carloads, bulk	0.15% max. C 33.60 36.40 37.60 0.30% max. C 32.10 34.90 36.10 0.50% max. C 31.60 34.40 35.60	load per net ton\$240.00 Ferrotungsten, % x down packed, per pounds contained W, ton lots delivered\$2.15
Less ton lots 35.10 17.70 Calcium-Silicon	Mn, 5.0-7.0% Si 28.60 31.40 32.60	W, ton lots delivered \$2.15 (nominal) Molybdic exide, briquets per lb
Per lb of alloy, lump, delivered, packed,	Silicomanganese Lump size, cents per pound of metal,	contained Mo, f.o.b. Langeloth, Pa. \$1.49 bags, f.o.b. Washington, Pa., Langeloth, Pa. \$1.38
30-33% Cr, 60-65% Si, 3.00 max. Fe. Carloads, bulk 24.00 Ton lots 27.95 Less ton lots 29.45	Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	Langeloth, Pa. \$1.38 Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight
Calcium-Manganese-Silicon Cents per lb of alloy, lump, delivered,	Carloads bulk	Carload, bulk lump 18.50¢
packed. 16-20% Ca, 14-18% Mn, 53-59% Si. Carloads, bulk	Briquets, packed pallets, 3000 lb up to carloads	Ton lots, packed lump 20.50¢ Less ton lots
Carloads, bulk	Silvery Iron (electric furnace)	Vanadium exide, 86-89% V ₂ O ₈ per pound contained V ₂ O ₈ \$1.38 Zircenium silicen, per lb of alloy
SMZ Cents per pound of alloy, delivered, 60- 65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.	Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls,	35-40% del'd, carloads, bulk. 26.25¢ 12-15%, del'd lump, bulk- carloads
Ten lots	N. Y., \$93.00. Silicon Metal	Boron Agents
V Foundry Alloy Cents per pound of alloy, f.o.b. Sus-	Cents per pound contained Si, lump size, delivered, packed.	Beresii, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb con-
pension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% St, 8-11% Mn, packed.	98.25% Si, 0.50% Fe. 24.95 98% Si, 1.0% Fe 24.45 23.15	tained B 2000 lb carload
Carload lots 18.45 Ton lots 19.95 Less ton lots 21.20	Silicon Briquets	Ton lots per pound 45¢ Less ton lots, per pound 50¢
Graphidox No. 4 Cents per pound of alloy, f.o.b. Sus-	Cents per pound of briquets, bulk, de- livered, 40% Si, 2 lb Si, briquets. Carloads, bulk	Cerbertam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	Electric Ferrosilicon	Ton lots per pound 14.00¢
Carload packed 19.20 Ton lots to carload packed 21.15 Less ton lots 22.40	Cents non th contained St Jump bulk	Ferreboron, 17.50 min. B, 1.50% max. Sl, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots. F.o.b. Wash., Pa., Niagara Fails, N. Y., delivered 100 lb up 10 to 14% B
Ferromanganese	Carloada, f.o.b. shipping point. 50% Si. 14.60 75% Si. 16.90 65% Si. 15.75 85% Si. 18.60 90% Si. 20.00	N. Y., delivered 100 lb up 10 to 14% B
Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Cents Producing Point Cents	Ferrovanadium	Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over
Producing Point per-lb Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. 12.25	50-55% V delivered, per pound, contained V, in any quantity. Openhearth	No. 78
Johnstown, Pa	Crucible	Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Sl, 3.00% max. C, 2 in. x D, del'd.
Philo, Ohio	Calcium Metal Eastern zone, cents per pound of metal,	Less ton lots (packed) 1.57
above or below base content. Briquets, delivered, 66 pct Mn: Carloads, bulk	delivered. Cast Turnings Distilled Ton lots \$2.05	Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Sl, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.16
158	(Effective Feb. 9, 1959)	THE IRON AGE. February 12, 1959



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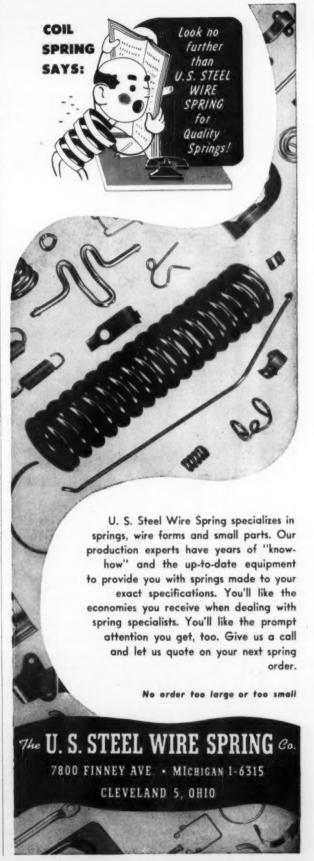
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Qu.	H.P.	Make	Туро	Velts	RPM	
1	3900	New Elliott	Enc. F.V.	475	820	
1	3000	New Whse.	Enc. F.V.	525	600	
1	2250	New Elliott	Enc. F.V.	600	200/300	
1	2200	G.E.	MCF	600	400/500	
1	1750	New Elliott	Enc. F.V.	250	175/250	
8	1500	New Whse.	Enc. F.V.	525	600	
L	1390	G.H.	MCF-12	300	200/400	
1	1200	G.E.	MCF	600		
1	1000	Whee.	MA U.S.	500	800/2000	
1	940	Wase.	QM	250		
2	940	8.8.	Enc. F.V.	600	800/1000	
2	990	G.E.	MCF		400/750	
3	765	Allis Ch.	MHC		1012/1350	
2	759	Q.E.		600		
1	750	G.E.	MCF	600		
1	750	G.E.	MCF	600		
2	645	8.8.	Enc. F.V.	300	1000	
4	608	Whee.	Assessed M. V.	256		
1	508	G.E.B.B.	TLF-2656H		2000/3600	
1	500	G.E.	MPC-10		188/400	
8	450	Whee.	MET C. TO	550	415	
2	409	G.B.	CY-275	300	1000/1500	
3	325	Allis Ch.	MHC	250	450/900	
1	200	Cr. Wh.	H-102 B.B.	230	1200	
2	275	G.E.B.B.	TLC-108		2000/4000	
ī	225	G.E.B.B.	177-100	250		
î	208	Rel. B.B.	T-664-D.P.	240	859	
1	200	Whee.	CB-207-4	250	850/1200	
î	150		CMC-65H	230		
1	150	G.E.B.B.	TLC-74		1150/3500	
î	150	G.E.B.B.	CD		250/750	
î	120	G.E.B.B.	TLC-50	050	1950/5000	
î		New Whse.	CB-210.3	230	300/1200	
í	120	Bel. B.B.	1050T	230		
2	125	Whee.	BK-190	230		
1	125	Whee.	8K-185	286		
	100		CDP-145	230		
1	88		8K-123.9			
1	75	GEBB	CD-1235-D.	D 600	858	
1	60/75				300/1200	
1	50	G.E.	T-664-D.P. CD-1136 TY-663	230	698/1050	
1	40	Rel. B.B.	TV-663	240		
1	30/40	Whee B. R	SK-131, TE	FC	200/1200	
		20.25	101, 112	250	500/1500	
1	25/38	Rel. B.B.	TY563	240		
1	40	Rel. B.B.	T-405-D.P.	240	1750	
6	48	15 Ct. PS. PS.	885F. TEFC			
1	30/40	Rel. B.B.	T-564-D.P.	240		
	MARR	CHEN A		-40	2001.900	

1 30/40 Rel. B.B. T-864-D.P. 240 300/990
MERCURY ARC RECTIFIERS
3-150 KW. G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C.
Pyranol filled transformers complete.
2-150 KW. G.E., Ignitron, 245 V. D.C., 230 V. A.C., air cooler transformers with controls.

MG SETS—3 Ph. 60 Cy.

-				DC	AC
Qu.	K.W.	Make	RPM	Volts	Valts
1	2000	G.E.	514	600	2300/4600
2	1750/2100		514	250/300	2300/4600
1	1750	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	600	680	11000/6600
1	1500	8.8. 8 unit	720	600	11000/6600
1	1500	Cr. Wh.		000	21000,0000
_		4 unit	720	100	2300
2	1000	G.B.	720	600	6000/13200
2	750	G.B.	720	250/300	6600/13200
1	500	G.10,	900	125/250	440
1	350	G.E.	900		0/2300/4160
1	300	G.E.	1200	250	2308/4600
1	300	G. III,	1200	250	440/2300
3	250	G.E.	900	250	440/2300
1	240	Whee.	900	125	220/440
1	200	Whee.	1200	558	2200
1	200	El. Mhy.	1200	258	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whae,	1200	275	2300
1	150	G.E.	1280	125	440
	140	Cr. Wh.	690	125/250	2300
1	100	G.E.	1170	250	220/440
1	100	Cr. Wh.	1800	240	440
2	100	Cr. Wh.	1160	525	220/550
1	100	G.E.	1280	250	2406/4100
2	75	Whee.	1200	125	440
		TRANS		MERC	***
Qu.	KVA N				24-24
ego.	0000 177		be L	h	Veltages

Qu.	KVA	Make	Type	Ph.	Veltages
8	3383	Whee.	OTSC	1	13800 x 2300
1		G.E. auto	HT	3	4000/4200/4400
- 3		G.E.	OA/FA	1	13800 x 230/460
2	750	G.E.	Pyranol	1	4800x85/55-255/165
-8	500	Kuhl	OISC	1	13200 x 6600
3	3833	G.E.	H8-W4B	1 1	2400/4160 240 x 480
3		G.E.	OISC	8	2400/4160Y x 600
3	150	G.E.	OISC	1	3300x2300/4000Y
38	100	G.E.	HS	1	480/8320/120/240
I	50	Mol.	OISC	3	13200 x 240-480
8	100	L.M.	T.A	1	4160/7200x240/480

CRANE & MILL MOTORS 230 V., D. C. H.P. Maks RPM 12/14 Whee. RPM 700/600 MCA-30, Seri

10.	85.8	MIKE	RPM	Туре
4	12/14	Whee.	700/600	MCA-30, Series
1	20	Whee.	975	K-5 Series
2	23	G.E.	650	MDS-408
2	25	G.E.	725	CO-1808, Series
1	85	Whee,	480	CK-9 Comp. 8.B.
1	28	Whee,	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. B.B.
3	50	G.E.	659	COM-1830 Comp.
3	50	Whee.	525	CK-9 Shunt R.B.
2	50	Whee,	600	CK-9 Comp. R.B.
1	50	G.E.	525	COM-1830AEB.B
1	50	Cr. Wh.	559	SW-50 Comp.
1	186	G.E.	475	CO-1832 S.B.
6	100/140	Whee.	500/415	MC-90 R.B.
		RE-NI	J-BILT	By

BELYEA COMPANY, INC. 47 Howell St. Jersey City 6, N. J. Tel. Oldfield 3-3334

THE CLEARING HOUSE

Pittsburgh Sales Inch Upward

Used machinery dealers there say some lines of equipment are fairly strong.

Lack of capital spending still hurts sales. But buyers are replacing obsolete machines when necessary.

 Pittsburgh used machinery dealers find business as good as it was or better. Gains are not widespread or old enough to establish a trend, but sales point upward.

For a machine tool supplier, January showed marked improvement. Orders were for milling machines, saws, lathes and other general purpose equipment. Demand for tool room items points to a broad-based recovery, rather than a few spot jobs. Plants are stepping up maintenance to support higher production levels.

Prices Steady—Prices of machine tools are holding fairly steady. It's still a buyers market but dealers are keeping their stocks down. Selective buying on their part has tended to loosen the supply of equipment. Dealers are keeping inventories at a level where they don't put excessive pressure on prices.

January was about in line with November and December for a supplier of steel mill equipment. Export continues to provide a large percentage of the activity. Canada and Latin America are the strongest markets.

Bar Mills Wanted — Accessory equipment is attracting the greatest

interest. Suppliers are getting orders for shears and straighteners for bars and shapes. Galvanizing equipment is being ordered.

Of the basic equipment lines, bar mills are the most active. In general, however, buyers are looking for auxiliary items rather than complete installations. Emphasis is on maintenance and replacement rather than expansion.

Prices for steel mill equipment have held up fairly well. If a plant can wait until a buyer turns up, it can get a fair price. If equipment must be moved out, it may bring only distress prices.

Material Handling Popular—Inquiries for material handling equipment picked up sharply in January. However, buyers are doing a thorough job of shopping around and orders are still lagging. Deliveries of new cranes have started to lengthen. Manufacturers were quoting 1-10 days a short time ago. Now they are out to two and three weeks.

Demand for motors and generators is called good by one supplier but no better than in November. Steel mills are ordering replacement equipment as it is needed. There has been no advance ordering and there is no spurt in new construction.

Electrical Market Slow—Condition of the electrical market is significant since demand in this line is very sensitive to steel activity. The sharp upturn in steel orders has brought no wave of business for electrical suppliers.

GOOD USED EQUIPMENT CONSIDER

BALERS
P-133 Logemann, Box Size 60" x 32" x 18\%"
P-115 Logemann, Box Size 100" x 48" x 24"
BENOING ROLLS
10' x 10 Ga, Bertach No. 6 Initial Type
12' x \%" Hiller & Jones Pyramid Type
32' x \%" BALDWIN PYRAMID TYPE—LATE
BRAKE—PRESS TYPE
12' x \%" Airnherm Model No. 3814
BUILDINGS
50' x 335' x 24' Under Span
70' x 760' x 35' Under Span O' x 39' Under Span OVERHEAD ELECTRIC TRAVELING ECTRIC TRAVELING
60' Span 230 Voit D.C.
55' Span 230 Voit D.C.
55' Span 230 Voit D.C.
39' Span 230 Voit D.C.
39' Span 230 Voit D.C.
48' Span 230 Voit D.C.
48' Span 230 Voit D.C.
129' Span 230 Voit D.C.
129' Span 230 Voit D.C.
100' Span 230 Voit D.C. P&H Milwaukee Shaw Whiting ton Shaw ton P&H ton N-B-P 1-2 ton N-H-P 1-20 ton Shepard Niles 77° Span DIEING MACHINE 77° Span 50 ton Henry & Wright, 4%" Stroke DRAW BENCHES 10,000 lb. Draw Benches

DRAW BENCHES

10,000 lb. Draw Bench, 50 ft. Draw
50,000 lb. Draw Bench, 41 ft. Draw
50,000 lb. Draw Bench, 20 ft. Draw
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GEAR REDUCERS
3000 H. P. United (2), Ratio 16.2-1 & 11.6-1
HAMMERS—BOARD DROP—STEAM DROP—STEAM
FORGING

800 lb. to 12,000 lb. incl.

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12" Waterbury Farrel 9 Rolls 6" Dia.
24" McKay 17 Rolls 2%" Dia.
66" Guide 17 Rolls 4%" Dia.
84" Bliss 17 Rolls 5%" Dia.
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Mattison #464 Polisher for 24" wide strip PRESS-EMBOSSING & COINING #664 Toledo 600 ton, 2" Stroke

PRESS__MMOSSING & CONTING
#664 Toledo 600 ton, 2" Stroke
PRESSES_HYDRAULIC
300 ton Southwark, Bed 28" x 28", Stroke 25"
300 ton Watson Stillman Piercing Press, 48" x 72"
500 ton HPM Fastraverse, Bed 30" x 32"
1000 ton HPM Fastraverse, Bed 48" x 72", 36" Stroke
PUNCKH_BEAM Bed 68 x 68", Stroke 40"
#14 Thomas Guillotine Type 225 ton Capy.
With 50 ft. Spacing Tables
PUNCH & SHEAR COMBINATIONS
#1% BURBIO Universal Ironworker

#1½ Buffalo Universal Ironworker EF Cleveland, 60" Throat ROLL—CoffRugaTiMe #3 Stanco, 24" Dia. Rolls, For Sheets 144"x40" ROLLING MILLS rrington Flat Wire Mill Line

100 Bertach Seven Rolls 9" Dia.

22" Niles 7 Rolls 9" Dia.

32" Niles 7 Rolls 9" Dia.

33% Lewis All Steel. Capy. 4" Rd., 3%" Sq.

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34 Mesta Cast Steel, Capy. 2" x 12" Cold

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Handles steel sheets 48" wide up to 1/16" thick

6" x 14 Ga. Edwards, Motor Drive—LATE

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10' x ½" Bertach

SLITTERS 10' x %" Niagara
10' x %" Bertsch
SLITTERS
S6" Yoder, 4\%" Dia. Arbor
36" Paxson Siltting Line, 6" Dia. Arbor
STRAIGHTENERS
Torrington \$1734 12-Roll, Capy, 1\%", Rd. 1-9/16"
%" Shuster Straightener, 12 Ft. Cut off
SWAGING MACHINES
"Type of The Set of Th

SWAGING MACHINES

4 Torrington 2-Die, Capy, 2" Tube, "%" Solid

#6A Fenn, Capy, 3%" Tube, 1½" Solid, 10" Die
Length, With Hydraulic Feed

TESTING MACHINES

20,000 lb, Baldwin Univ. Hydraulic
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1/2 Tube Reducer for steel
1/2 Tube Reducer for steel
WIRE DRAWING MACHINES
Type B Morgan 4-Block Capp. #5 Red down Scudder 3-Block 20" Dia.
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14"x33" centers Sidney, m.d.
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14"x33" centers LeBlond Geared Head, s.p.d.
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14"x35" centers Prott & Whitney, cone
14"x54" centers LeBlond Regal, m.d.
16"x283½" centers Hendey Yoke Head, m.d.,
16"x283½" centers Hendey Yoke Head, m.d.,
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1000	°G.E.	M-575-S	1200
1000	"West.	CW	450
600	"G.E.	M-6345-S	1800
500	G.E.	M-6345	1200
400	°G.E.	MTP-565	1200
350	"Al-Ch	ARYW	1800
300	Cr-Wh	SR70-R	1800
250	A1-Ch	ARY-626	1880
250	°G.E.	I-M-17A	720
200	G.E.	1-M-16	600
200	"West.	CW-1950A	514
150	Cr-Wh	SR-50R	1800
150	G.E.	1-M-15A	600
125	G.E.	1-M-15A	600
100	G.E.	1-E-13A	1800
100	G.E.	MT558	720
100	G.E.	I-M-15A	425
75	West.	CW-770	1200
75	G.E.	MT-347	1200
75	G.E.	MT-356	900
75	G.E.	MT-352	720
75	G.E.	1-M-10	600
60	G.E.	MT-356	1200
60	"West.	CW-762C	900
50	°G.E.	MT-536	1200

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20	2250	Whae,	720	600	11,000/2200
1	1875	Whse.	514	250	13,800/4160
1	1250	Gen. Elec.	450	132/265	4160
2	1250	Whse,	720	600	4160/2400
1	900	Whse.	720	600	13,800/4160
1	850	Gen. Elec.	720	250/300	13,800/4160
1	500	Al.Ch.	600	250	2300
10	300	Al.Ch.	1200	250/300	2300
10	300	Whse.	1200	125/250	4000/2300
4)	200	Whse.	1200	125/250	4000/2300
1	150	Gen. Elec.	1200	250/275	440/220
1	150	Rel.	1200	125	2300
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100	2200	Whse.	Vent.	600	92/132
400	1500	White.	Rev.	300	300/700
R.o.	1500	Whse.	Vent.	600	600
100	700	Whse.	Vent.	250	285/700
2	645	8.88.	Mill	300	1000
1 2	600	Whse.	Mill	250	110/220
2	600	Al.Ch.	Mill	600	300/600
1	300	Whse.	Mill	250	300
1	175	Gen. Elec.	CD-175	250	800/1025
1	840	Rel.	651-T	230	575/1150
10	50	Gen. Elec.	CD-175	230	400/1200
20	30/40	Whae.	SK-131	230	500/1500
	FP 52 52 62	00 Emple	Lungay Lunga	Worke 61	Sector

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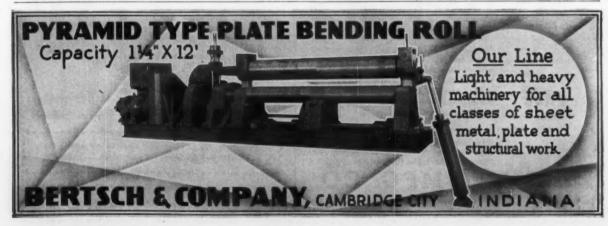


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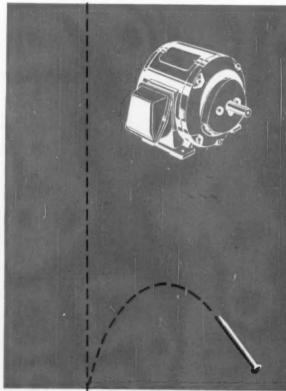
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